Landscape Design and Integration

Sybase Unwired Platform 2.2

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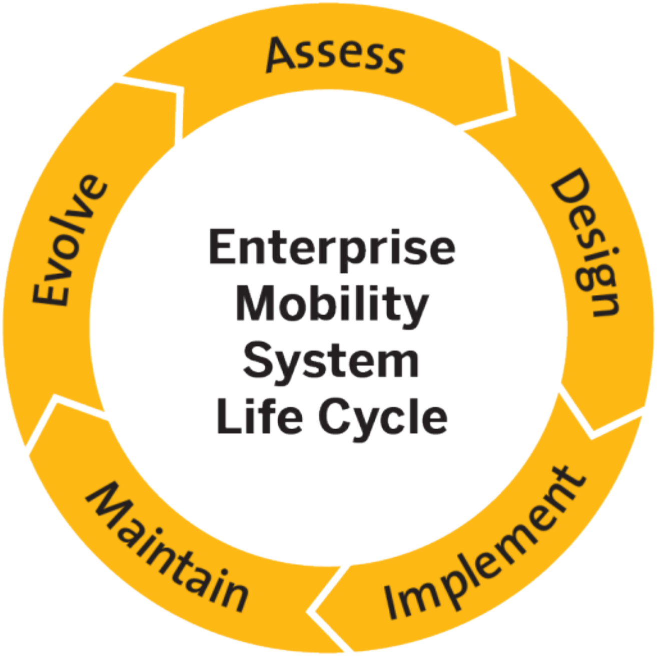
Contents

Sybase Unwired Platform System Life Cycle

Use the Sybase® Unwired Platform life cycle to define required IT processes for implementing and altering your enterprise mobility management system. Understand each phase so you can successfully deploy and evolve platform components into your ecosystem.

Sybase recommends that you review the contents of this document before using the *Installation Guide for Runtime*.

For Unwired Platform, the life cycle is represented by these stages:



For Sybase Unwired Platform 2.2, this document covers the Assess, Design, and Implement stages of the enterprise mobility life cycle.

Stage 1: Assess

The objective of this stage is to conduct a preliminary analysis of your existing IT ecosystem. Define the mobility goals and required functions and operation of the intended mobile applications and runtime system.

Ecosystem assessments should include:

- Physical plant resources (power, rack space, cable drops, and so on)
- Network design and configuration
- Access control and authentication (information security) mechanisms
- Availability of suitable host systems
- Availability of EIS resources

From the assessment, gather requirements that will help you make design-phase decisions.

Host Platform Requirements

Provision host systems to meet Unwired Platform Runtime host requirements.

All Unwired Platform Runtime hosts must meet the requirements specified in *Supported Hardware and Software* for:

- Minimum host resources (CPU, RAM, and local storage space)
- Operating system (including edition, version, and service pack)

See also

- *SAP® Ecosystem Interoperability Requirements* on page 5
- *Network Communications Requirements* on page 6
- *EIS Requirements* on page 9
- *Authentication and Authorization Security Requirements* on page 10
- *Intrusion Detection and Protection Requirements* on page 10

General Runtime Host Requirements

Guidelines to follow when provisioning hosts for the Unwired Platform Runtime components (Unwired Server and data tier servers) in single-host or clustered landscape designs.

See *Supported Hardware and Software* for basic hardware and operating system requirements. This topic supplements that basic information.

Note: In addition to the resource and OS requirements specified in *Supported Hardware and Software*, the target server cannot include an instance of Sybase Control Center that has been installed for another Sybase product.

The following must be identical for all Unwired Platform hosts:

- Product edition and license type
- Processor (32-bit or 64-bit) – you can install the Sybase Unwired Platform Enterprise Server Edition only on 64-bit operating systems. You can install the Personal Development Server and Enterprise Development Server Editions on either 32-bit or 64-bit operating systems.
- Operating system – edition, version, and service pack, as well as any intermediate patches or updates
- Unwired Platform software version – including any support package or patch-level updates

See also

- *Data Tier Failover Cluster Host Requirements* on page 4
- *Unwired Server Cluster Host Requirements* on page 4

Data Tier Failover Cluster Host Requirements

Guidelines for requisitioning and setting up the hosts for data tiers in a Microsoft Failover Cluster.

In addition to the general Runtime host requirements:

- All data tier hosts in the cluster must have identical host resources (CPU, RAM, local storage, network and host bus adapters, and so on).
- Host processor architecture must use the same word size (32-bit or 64-bit) as the Unwired Server hosts.
- All data tier hosts must have the appropriate Microsoft Failover Cluster software enabled.
- Follow current Microsoft guidelines for networks, hosts, and storage devices used in a failover cluster.

See also

- *General Runtime Host Requirements* on page 3
- *Unwired Server Cluster Host Requirements* on page 4

Unwired Server Cluster Host Requirements

Guidelines for requisitioning and setting up the hosts for Unwired Server instances in a cluster.

In addition to the general Runtime host requirements:

- Hosts in the Unwired Server cluster need not have identical system resources, but they should have similar processing capabilities, and use the same operating system.
- Host processor architecture must use the same word size (32-bit or 64-bit) as the data tier hosts

See also

- *General Runtime Host Requirements* on page 3
- *Data Tier Failover Cluster Host Requirements* on page 4

SAP® Ecosystem Interoperability Requirements

To share information and services in an SAP landscape, define the degree to which the information and services are to be shared with Unwired Platform. This is a very useful architectural requirement, especially in a complex or extended enterprise.

For SAP Change and Transport System (CTS) requirements, see *Supported LoadRunner Versions*, *CTS Requirements*.

See also

- *Host Platform Requirements* on page 3
- *Network Communications Requirements* on page 6
- *EIS Requirements* on page 9
- *Authentication and Authorization Security Requirements* on page 10
- *Intrusion Detection and Protection Requirements* on page 10

SAP SLD Interoperability Requirements

For SAP environments that use Solution Manager for runtime root-cause analysis, configure a destination System Landscape Directory (SLD) server. This configuration allows Unwired Platform to deliver runtime information to a common SAP SLD repository, keeping information about your SAP and Unwired Platform mobility infrastructure complete and current.

To use Unwired Platform data with an SLD:

- **Determine Unwired Server cluster and data tier strategy –** you can configure SLD in a cluster of two: the primary and secondary servers perform different activities, and the cluster database aggregates and holds data. Depending on your schedule and your cluster design, this might place demands on your cluster database.
- **Install dependencies –** the installed version of SLD is for SAP NetWeaver 7.0 (2004s) SPS07 or higher. The SLD to which you register must be the latest Common Information Model version (currently 1.6.30).
- **Set up the SLD –** verify that the SLD is available to Unwired Server and configured to receive data. For more information, see the *Post-Installation Guide* and the *User Manual* for your SAP NetWeaver version on SDN: *http://www.sdn.sap.com/irj/sdn/nw-sld*.
- **Set connection properties –** collect and deliver to the platform administrator. Determine the connection values to the SLD server, including its host name, protocol (HTTP or HTTPS), port, and the SLD user account.

- **Encrypt any dependent certificates –** if SLD is configured to use HTTPS, ensure that the SLD server certificate is signed by a known certificate authority. Otherwise, you must manually import the certificate into the Unwired Server (primary node only) certificate truststore. See *Truststore and Keystore Properties* in the *Security* guide.

See *SAP SLD Server Overview* in *System Administration*.

See also

- *SAP License Audit Requirements* on page 6

SAP License Audit Requirements

For SAP applications like OData SDK Applications, administrators can generate an XML file that contains usage audit data that is then sent to the SAP License Audit. The XML file, which is compatible with the License Audit infrastructure, includes counts of users using the applications currently deployed to Unwired Server.

To use Unwired Platform data with SAP License Audit determine how the data is used. Review the contents of *SAP License Audit and Application Data Overview* in *System Administration* to see how data is extracted and delivered to SAP.

See also

- *SAP SLD Interoperability Requirements* on page 5

Network Communications Requirements

Network and host provisioning must accommodate Unwired Platform internal communications.

When Unwired Platform runtime components are installed on more than one host, they depend on network connections for some inter-process communication. Configure the local network to allow all communications between Unwired Platform runtime components.

When all Unwired Platform runtime components are installed on a single host, they depend on regular IP communication on the primary network interface of the host.

See also

- *Host Platform Requirements* on page 3
- *SAP® Ecosystem Interoperability Requirements* on page 5
- *EIS Requirements* on page 9
- *Authentication and Authorization Security Requirements* on page 10
- *Intrusion Detection and Protection Requirements* on page 10

Unwired Platform Port Accommodation

Infrastructure provisioning must accommodate all ports required by Unwired Platform runtime components.

To accommodate Unwired Platform ports, you may need to:

- Configure personal firewalls or host-based intrusion protection (HIPS) to allow access to component ports. See *Handling Intrusion Detection/Prevention Software* in the *Security* guide.
- Configure Unwired Platform servers to change port number assignments.
  - You can change default port assignments for Unwired Platform server components and Sybase Control Center during installation.
  - You cannot change assignments of Unwired Platform reserved ports. For a complete list, see *Reserved Ports*.

  Note: If there is a conflict for port 2480 or 2481, Unwired Server will not start, and you cannot use Sybase Control Center to change those Unwired Server ports. You must temporarily stop the service that uses the conflicting port, then start Unwired Server so you can change the port assignment from Sybase Control Center.
- Reserve ephemeral ports on Unwired Platform hosts to prevent other processes from using them.

  Note: Even if the installer does not detect a conflict, the Windows operating system may later use additional ports in the 1024 – 65535 range. In that event, you may encounter intermittent problems starting Unwired Platform services.

  See the Microsoft operating system documentation to learn how to reserve ephemeral ports.

See also

- *Requirements for Load Balancers* on page 7
- *Unwired Server Ports* on page 75
- *Data Tier Ports* on page 76
- *Sybase Control Center Ports* on page 76
- *Relay Server Ports* on page 77
- *Reserved Ports* on page 77
- *Other Ports* on page 78

Requirements for Load Balancers

Client and DCN guidelines for deploying a third-party load balancer that is connected directly to Unwired Server ports.

Note: Sybase does not recommend or endorse any specific third-party load balancer appliance, device, or software.

See also

- *Unwired Platform Port Accommodation* on page 7

Requirements for Client Load Balancing

Client guidelines for deploying a third-party load balancer that is connected directly to Unwired Server client ports.

The load balancer must:

- Balance connections at the TCP/IP level.
- Perform all load balancing on client connections to the Unwired Server cluster, independent of any other network device.
- Connect directly to the client ports of each Unwired Server in the cluster.
- Support client request routing (that is, back-end server affinity) for nonpersistent HTTP connections, for these way the load balancer dispatches requests, based on the HTTP header or cookie:

Load Balancer Dispatches...	HTTP Header (or Cookie)
All client requests to Relay Servers	`ias-rs-sessionid`
Replication based synchronization (RBS) client requests directly to Sybase Unwired Platform	`ml-session-id`
Other client requests directly to Sybase Unwired Platform	`X-SUP-SESSID` (cookie)

  For REST API applications, see also *Reference* topic in *Developer Guide: REST API Applications*, especially the *HTTP Headers and Cookies* subtopic.
- Map reverse proxy ports to Unwired Server ports.
- If both new version clients (Sybase Unwired Platform 2.2.0 and later) and old version clients (Sybase Unwired Platform 2.1.x and earlier) are supported, set up Relay Servers between Unwired Server and load balancers and route client requests based on `ias-rs-sessionid`.
- If both replication based synchronization (RBS) clients and other types of clients are supported, set up Relay Servers between Unwired Server and load balancers and route client requests based on `ias-rs-sessionid`.

Note: To allow header inspection, the load balancer must be a transport-layer security (TLS) endpoint on HTTPS connections from mobile clients.

Requirements for DCN Load Balancing

DCN guidelines for deploying a third-party load balancer that is connected directly to Unwired Server DCN ports.

The load balancer must:

- Balance connections at the TCP/IP level.
- Perform all load balancing on EIS connections to the Unwired Server cluster, independent of any other network device.
- Connect directly to the DCN port of each Unwired Server in the cluster.

EIS Requirements

You may need to provision some enterprise information system (EIS) resources to enable Unwired Platform to use data services provided by the EIS.

See also

- *Host Platform Requirements* on page 3
- *SAP® Ecosystem Interoperability Requirements* on page 5
- *Network Communications Requirements* on page 6
- *Authentication and Authorization Security Requirements* on page 10
- *Intrusion Detection and Protection Requirements* on page 10

EIS Driver Requirements

Unwired Platform includes drivers for Sybase databases, such as Adaptive Server® and SQL Anywhere®, and Web services. For nonSybase data sources, such as DB2, Oracle, or Microsoft SQL Server, you must install the appropriate drivers.

Depending on the type of enterprise information system (EIS) connection, you may need to copy some driver and library files to the Unwired Server installation directories.

In an Unwired Server cluster, each host must have the appropriate drivers installed.

See *Supported Hardware and Software* for the most current supported versions of different EISes, and different versions of drivers for the same EIS.

See also

- *SAP External Libraries Requirements* on page 9

SAP External Libraries Requirements

Understand the requirements for external files you can optionally download from SAP and install into Unwired Platform to enable communication with an SAP EIS.

- **SAP Cryptographic Libraries –** required by Unwired Platform to enable Secure Network Communications (SNC) between Unwired Server or Sybase Unwired WorkSpace and the SAP EIS.
- **SAPCAR utility –** required to extract files from the SAP cryptographic library.

See also

- *EIS Driver Requirements* on page 9

Authentication and Authorization Security Requirements

If you do not effectively define security requirements in advance, you cannot evaluate the resulting system for success or failure prior to implementation. The features that currently exist determine how Unwired Platform security is affected by your infrastructure.

- **Roles and distribution of assignments –** you can map roles at various levels: domain, security configuration, application, and package. To prevent mapping collisions, identify the roles that need to exist, and how to map them.
- **Security provider strategy –** identify the existing built-in security providers, and the ones you can create using the CSI API. The security providers you configure in Unwired Platform pass authentication and authorization information to the provider used in your environment. Identifying the providers simplifies the implementation of a security configuration by the platform administrator after installation. If you are using SSO with a security provider, you may also need to prepare libraries and other back-end components. See the postinstallation requirements documented in *Stage 3: Implement*.

See also

- *Host Platform Requirements* on page 3
- *SAP® Ecosystem Interoperability Requirements* on page 5
- *Network Communications Requirements* on page 6
- *EIS Requirements* on page 9
- *Intrusion Detection and Protection Requirements* on page 10

Intrusion Detection and Protection Requirements

To accommodate Unwired Platform internal communications, you may need to reconfigure hardware or software intrusion detection/prevention systems.

- Configure "personal firewall" applications, or host-based intrusion prevention software (HIPS) to allow all communications between Unwired Platform server components.
- To prevent required internal component communication ports from being blocked, configure an intrusion prevention system (IPS), or intrusion detection and prevention system (IDPS) appliances to allow connections to the ports Unwired Platform uses.
- When you install any new intrusion detection/prevention system on an Unwired Platform server host, or on a local network that services an Sybase Unwired Platform server host, configure that new system to accommodate all Unwired Platform internal communications.

See also

- *Host Platform Requirements* on page 3
- *SAP® Ecosystem Interoperability Requirements* on page 5
- *Network Communications Requirements* on page 6
- *EIS Requirements* on page 9
- *Authentication and Authorization Security Requirements* on page 10

Stage 2: Design

In the design stage, you create the landscapes, process diagrams (beyond the scope of this document), perform license selection, and prepare supporting documentation (including installation worksheets). The design stage uses the requirements identified during the assessment stage.

Each requirement produces a set of one or more design elements which are intended to describe the software in sufficient detail allow any IT member to perform the installation.

Understanding Landscape Options

Gathering information about all installable options for Unwired Platform provides the required foundation for making implementation decisions for your installation environment.

Single-Server Installations

In a single-server installation, one Unwired Server node and a data tier are installed during a single installation procedure, executed on a single host.

A single-server Unwired Platform Runtime system is simpler, less expensive to deploy, and generally easier to maintain. However, it also has significant limitations:

- It cannot be scaled by adding or subtracting servers, to adapt to changes in system load or performance requirements.
- It cannot take advantage of conventional load-balancing and failover mechanisms to provide a greater level of system availability.
- The only way you can increase overall system performance is by upgrading the host system resources (CPU, RAM, and so on).

Note: You cannot upgrade a nonclustered Unwired Platform system to a clustered system. You must redeploy the Unwired Platform system, using cluster installation options on suitable hosts.

Plan carefully when you choose between clustered and nonclustered designs. If you can foresee any future requirement for a clustered system, such as a service level agreement (SLA) that would require scalability, or higher system availability, consider initially deploying a clustered Unwired Platform system.

Cluster Installations

In a cluster installation, data tiers, Unwired Server nodes that are installed as application server nodes, and (optional) Unwired Server scale-out nodes, are installed by separate installation procedures, typically on separate hosts.

There are two main advantages of a clustered Unwired Platform system:

- It can be scaled by adding or subtracting servers (nodes in a cluster), to adapt to changes in system load or performance requirements.
- Redundant cluster nodes allow conventional load-balancing and failover mechanisms to provide a greater level of system availability.

In a typical clustered system, Unwired Server instances do not share host system resources with data tier servers.

Choose a clustered system design to meet requirements for scalability, higher availability, and overall higher system performance.

Unwired Server Load-Balancing Clusters

The Unwired Server cluster enables load balancing to improve system availability and performance.

An Unwired Server cluster consists of two or more Unwired Servers that:

- Service the same set of client devices, users, and mobile applications
- Rely on the same set of enterprise information systems to provide back-end data services
- Rely on the same data tier resources to provide runtime data services

Because they share common data tier resources, all Unwired Servers in the cluster have access to the same cached data from the EIS, messaging data for clients, cluster and server configuration data, and system log data.

The common data tier lets you easily scale the Unwired Server cluster, adding or removing nodes at any time.

With a load balancer, such as Relay Server, or a third-party load balancer appliance:

- Unwired Servers in the cluster can share workloads, improving performance and efficiency
- Clients have a common point of access, independent of any particular Unwired Server in the cluster

Data Tier Failover Clusters

The data tier failover cluster provides high availability and fault tolerance.

Note: The data tier cluster relies on cluster services provided by a Windows Server operating system (such as Microsoft Cluster Service, or Failover Clustering).

A data tier cluster consists of:

- Two data tier hosts, each managed by a Windows-based failover cluster service
- At least one fault-tolerant storage device, which provides the shared cluster storage for database files and transaction logs

Each data tier host is a redundant node in the failover cluster—one active, and one standby (or passive). Host system performance is more critical for the data tier servers, because each host must assume the entire load imposed by the Unwired Server cluster.

To deploy the data tier in a failover cluster:

- All data tier server software must be installed on a local drive, on each data tier host. The data tier software cannot be installed on shared cluster storage, or on any storage resource that can be managed independent of the data tier host.
- All data tier database files and transaction logs must be located on a shared-cluster storage device, such as a SAN device that is assigned the appropriate RAID level.
- Each data tier host must be physically connected, by a host bus adapter, to the shared cluster storage device. Each volume that houses a database file system must be accessed as a local disk, on each data tier host.
- All data tier services must be configured as cluster resources, managed in the context of a common cluster instance.

To a Unwired Server, data tier hosts in a failover cluster appear to be a single, logical data tier entity.

Note: Follow current Microsoft guidelines for networks, hosts, and storage devices used in a failover cluster.

Enhanced Load Balancing

A cluster of two or more Unwired Server nodes provides some degree of load balancing, but load balancing can also be applied to both client connections and EIS connections, to improve performance and efficiently use resources in the Unwired Server cluster.

There are two load-balancing mechanisms you can use with the Unwired Server cluster:

- Relay Server – an Sybase software product that acts as a reverse proxy server for client devices communicating with Unwired Server.
- Load balancer appliance – a third-party product, such as an L4 network switch, can be used for both client and EIS connections.

Note: You cannot use Relay Server on EIS connections.

Client Load Balancing

Client load balancing improves capacity and performance of the Unwired Server cluster when it is servicing mobile client requests.

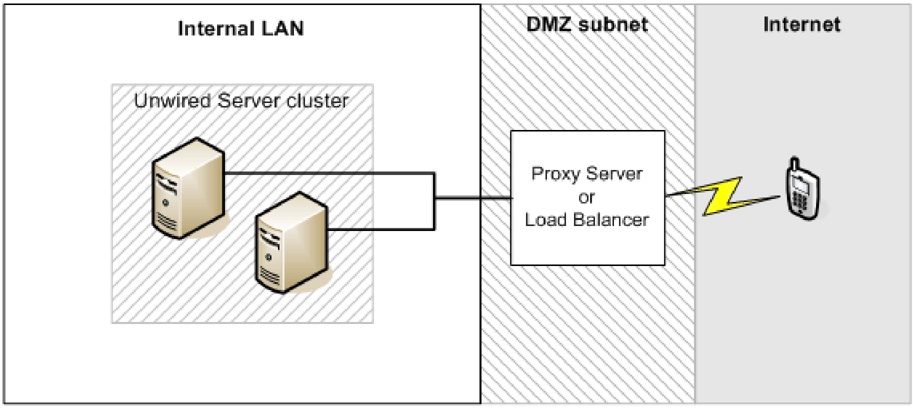
With load balancing on client connections:

- Unwired Servers in the cluster can share the client workload, improving the efficiency of services to client devices.
- Clients have a common point of access, independent of any particular Unwired Server instance.

There are two types of client load balancing to consider:

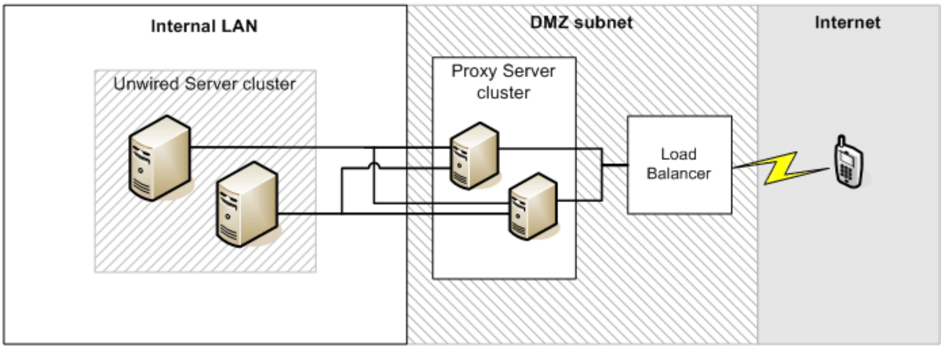
- **Simple load balancing –** you can deploy either one proxy server, or a load balancer appliance, to implement client load balancing on a single network node.

Figure 1: Load Balancing with One Proxy Server or Load Balancer



- **Clustered load balancing –** for higher capacity or higher availability, you can deploy a proxy server cluster, with or without a front-end load balancer appliance.

Figure 2: Load Balancing with Proxy Server Cluster



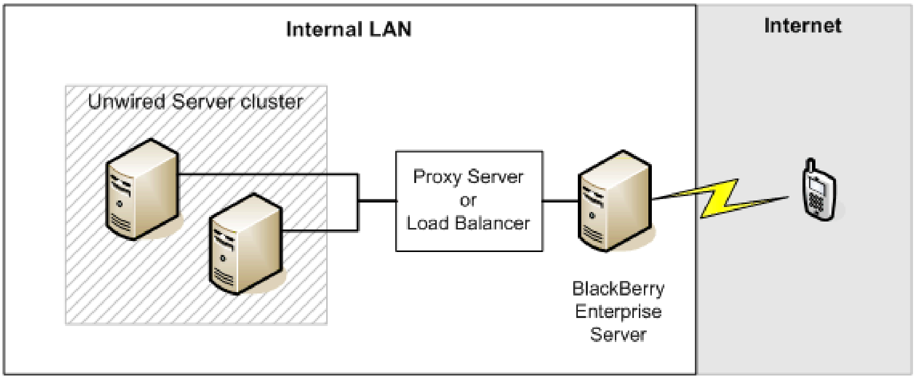
Client Load Balancing with BES

You can apply load balancing to connections between BlackBerry Enterprise Server (BES) and Unwired Servers in a cluster.

When you deploy an Unwired Platform system to support BlackBerry device users, BES treats the Unwired Server as a back-end enterprise application. Connections from BES are treated as client connections by Unwired Server.

To implement client load balancing on connections between BES and Unwired Servers in a cluster, you can deploy either a proxy server, or a load balancer appliance.

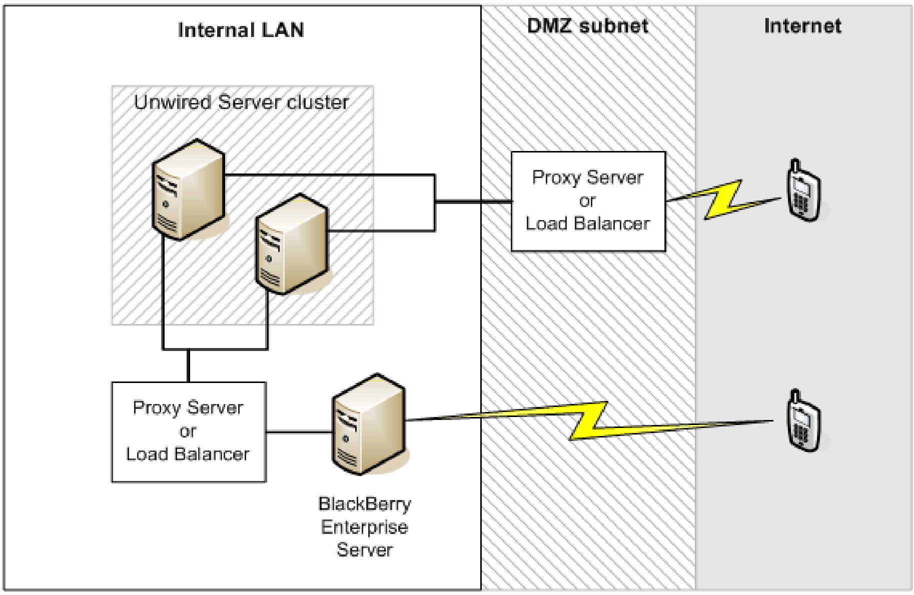
Figure 3: Load Balancing with BES (BlackBerry Clients)



The load-balancing mechanism between BES and Unwired Server is deployed on the internal LAN.

If your Unwired Platform system supports both BlackBerry device users and users of other device types, you can apply load balancing to both BES connections and other client connections.

Figure 4: Load Balancing with Both BlackBerry and Other Clients



EIS Load Balancing

EIS load balancing improves the capacity and performance of the Unwired Server cluster when it services data change notification (DCN) or Sybase SAP® Data Orchestration Engine Connector requests from the back-end enterprise information system (EIS).

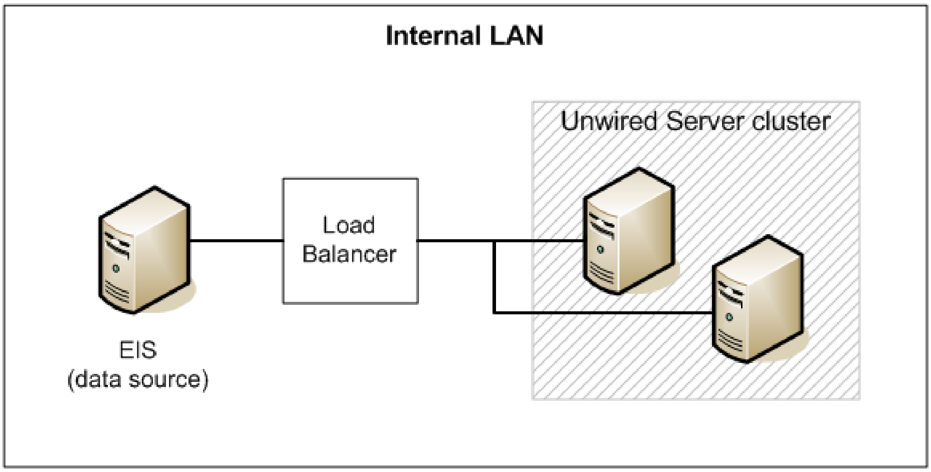
With load balancing on EIS connections:

- Unwired Servers in the cluster can share DCN or DOE-C workloads, improving the efficiency of service for mobile applications that rely on replication synchronization (or data that is "pushed" from the server).
- The EIS need not rely on a connection to any particular Unwired Server in the cluster, eliminating the Unwired Server as a single point of failure in DCN or DOE-C processing.

To implement load balancing on connections between the EIS and Unwired Server, you must use a third-party load balancer.

You cannot use proxy server on connections between the EIS and Unwired Server.

Figure 5: Load Balancing on EIS Connection



Designing the Landscape

Sybase Unwired Platform supports a variety of system design options to suit deployments ranging from a personal system on a single workstation to full-scale, clustered production systems.

1. Using the requirements you gathered during the assessment stage, determine factors that might influence your design choice.

   Major factors that affect system design choices are:
   - Deployment scenario (personal or enterprise system, development or production system)
   - Balancing system cost and complexity, with scalability and performance
   - Required Unwired Platform functionality and capabilities, some of which are limited to either clustered or nonclustered system designs
2. Review the landscape designs recommended by Sybase.
3. Create your own instance of that design, by choosing:

   - The hosts you require
   - Components installed on those hosts
   - System interoperability paths
   - EIS connection points
   - Security connection points

Choosing Licenses

Before installing Unwired Platform, determine your license type.

For evaluation versions of Unwired Platform, you do not need a license to perform a single-server installation (all components installed to a single host). For all other installations, the appropriate license must be loaded and available on all hosts before you can run the installer.

1. *Assessing License Needs*

   Identify your environment type, and the license model you need to support. These criteria help you choose the license type so you can purchase licenses.
2. *Mapping Environment to Product Editions and License Types*

   Once you have identified your environment type and the system design you need to support, map those requirements to the available license types.
3. *Purchasing Licenses Before Installing*

   Once you have identified your product edition and license type, you can proceed with purchasing the licenses.
4. *License Validation*

   Attributes in a license file define the number of Unwired Server instances that are allowed to run concurrently, the number of mobile clients that can connect to the Unwired Server, and the license expiration date.

Assessing License Needs

Identify your environment type, and the license model you need to support. These criteria help you choose the license type so you can purchase licenses.

Two attributes of each Unwired Platform server license determine your license requirements:

- **Product edition** – addresses the Unwired Platform system design options and your intended use.
- **License type** – addresses other license terms, such as per-seat (workstation) or per-core (server) allowances, and number of mobile devices, users, or applications supported.

See also

- *Mapping Environment to Product Editions and License Types* on page 23

Environments and Product Editions

You can deploy Unwired Platform to different environments. Sybase Mobile SDK (development) and Unwired Platform Runtime components are licensed separately. The type of environment targeted helps you to determine the appropriate product edition and license type.

- Development is a preproduction environment where applications are developed on a single host, using a Personal Development Server license. A simple load-balancing cluster may be necessary, using an Enterprise Development Server license, if application performance is to be tested. For this environment, purchase a Sybase Mobile SDK license for each developer workstation.
- Qualification is another preproduction environment that is used to test applications and runtime properties. If your budget allows, qualification environments should replicate production environments as closely as possible. A Microsoft Failover Cluster is used, with Unwired Platform installed using an Enterprise Development Server license. Any developer workstation involved requires its own Sybase Mobile SDK license.
- Production is a live runtime environment that uses a Microsoft Failover Cluster, with Unwired Platform installed using an Enterprise Server license. For this environment, you require Unwired Platform Runtime that can be licensed according to the number of CPU cores, clients, and developer workstations used. If any developer workstations are involved, each requires its own Sybase Mobile SDK license.

Server Product Editions

Unwired Platform Runtime components are licensed according to the product edition.

All Unwired Platform Runtime editions include Unwired Server and data tier components.

Do not use Unwired Platform Runtime licensed under development-specific product editions (Personal Development Server and Enterprise Development Server) in a production system.

Product Edition	Summary
Personal Development Server PE Code = PD	• Allows use in development systems and testing systems only; not for use in production systems. • Requires all Unwired Platform server components to be installed on the same, single-user host with Sybase Mobile SDK. • Allows a maximum of five mobile client devices.
Enterprise Development Server PE Code = ED	• Allows use in development systems and testing systems only; not for use in production systems. • Allows each installable component to be located on a separate host. • Allows clustered systems. • Allows a maximum of 20 mobile client devices.

Product Edition	Summary
Enterprise Server PE Code = EE	• License type determines allowed use (production only, or development and testing only). • Allows each installable component to be located on a separate host. • Allows clustered systems. • Requires separate license for mobile client devices (production). • Allows unlimited mobile client devices (development and testing).

Note: You can install the Sybase Unwired Platform Enterprise Server Edition only on 64-bit operating systems. You can install the Personal Development Server and Enterprise Development Server Editions on either 32-bit or 64-bit operating systems.

License Types

Each license type is associated with one or more Unwired Platform product editions.

License Type	Summary
Standalone seat license LT Code = SS	• Unwired Platform Runtime components must be installed on same host as Sybase Mobile SDK. • Available only with Personal Development Server Edition.
Development and test license LT Code = DT	• Servers licensed for development and testing use only; no production use allowed. • No limit on CPU/cores or host configuration (single or multiple hosts, clusters, and so on) • Available with Enterprise Development Server and Enterprise Server Editions.
CPU/core license LT Code = CP	• Servers licensed by CPU/cores, for production use only; no development and testing use allowed. • No limit on host configuration (single or multiple hosts, clusters, and so on). • Available only with Enterprise Server Edition.

License Type	Summary
OEM license LT Code = AS	• Unwired Platform servers to be bundled with packaged applications and redistributed. • Servers licensed for production use only; no development and testing use allowed. • Unserved license only, same license on all server hosts (no host ID required), no limit on CPU/cores or host configuration (single or multiple hosts, clusters, and so on). • Clients only are counted for licensing/royalties (various terms). • Available only with Enterprise Server edition.

License Deployment Models

Software licenses for Unwired Platform use the Sybase® Software Asset Management (SySAM) system. SySAM provides two license deployment models from which to choose.

- **Unserved license –** each license is granted for one specific host. The license file must be stored locally, on the Unwired Platform host. The license cannot be transferred to another host.
- **Served license –** a license is granted for a number of hosts. The license file is stored on a SySAM license server, and the license can be automatically acquired (checked out) by any Unwired Platform host.

If you choose the served license model, you must deploy a SySAM license server to support the system, and you must enable network communications between the SySAM license server and all Unwired Platform Runtime hosts.

Refer to the *SySAM Users Guide* for details.

Mapping Environment to Product Editions and License Types

Once you have identified your environment type and the system design you need to support, map those requirements to the available license types.

1. Choose a product edition for the environment into which Unwired Platform is being installed:

Environment	Product Editions Supported
Development	ED, PD
Qualification	ED (pilot) or EE (pilot/QA testing)
Production	EE and ED

2. Choose a license type for the product edition selected:

	SS	DT	CP
PD	X		
ED		X	
EE		X	X

See also

- *Assessing License Needs* on page 20
- *Purchasing Licenses Before Installing* on page 24

Decision Criteria: DT and CP Licenses for EE Servers

The Enterprise Server Edition is available with DT and CP licenses.

If you are choosing between these license types, review these criteria to help you evaluate which option to choose.

Criteria	CP	DT
Usage	Production	Testing
Server license base	Per core	Per core
Client licensing	Separately licensed, per application connection	Included
Sybase Unwired WorkSpace	Requires separate product edition, separate license	Requires separate product edition, separate license

Purchasing Licenses Before Installing

Once you have identified your product edition and license type, you can proceed with purchasing the licenses.

1. Review your landscape design, and determine the number of nodes in your deployment.

   This determines the number of licenses you need to purchase. Each redundant node is separately licensed.
2. Arrange for the purchase of the number of licenses requred.
3. After the purchase of licenses is completed, download the licenses.

   When you purchase SySAM 2-enabled Sybase products, you must generate, download, and deploy SySAM product licenses.

   - If you ordered your product under an SAP® contract and were directed to download from SAP Service Marketplace (SMP), you can use SMP at *http://service.sap.com/licensekeys* (login required) to generate license keys for Sybase products that use SySAM 2-based licenses.

- If you purchased your product from Sybase® or an authorized Sybase reseller, go to the secure Sybase Product Download Center (SPDC) at *https://sybase.subscribenet.com* and log in to generate license keys. The license generation process may vary slightly, depending on whether you ordered directly from Sybase or from a Sybase reseller.

For license download and installation instructions, see *Obtaining a License* in *Installation Guide for Runtime*.

See also

- *Mapping Environment to Product Editions and License Types* on page 23

License Validation

Attributes in a license file define the number of Unwired Server instances that are allowed to run concurrently, the number of mobile clients that can connect to the Unwired Server, and the license expiration date.

Each Unwired Server instance must have its own server license. In an Unwired Server cluster, all nodes can share a common pool of mobile client licenses.

Note: In a clustered design, choose the served license deployment model to enable license coordination in the Unwired Server cluster.

The Unwired Server checks both server and mobile client licenses.

- **At startup** – If the Unwired Server cannot retrieve the number of licensed servers from the license file, or if the server is not licensed, the Unwired Server stops (or enters the license grace period, if any).
- **At mobile client connection** – When a mobile client connects, the Unwired Server checks whether the client exceeds the client license limit. If so, the Unwired Server throws a license check exception to the client. Otherwise, the connection continues and operations proceed normally.

The Unwired Server writes all license errors to the log.

Stage 3: Implement

The implementation stage uses the documentation produced by the design stage. IT personnel use any documentation, for example, completed worksheets design documents, or diagrams, as the concrete guidelines for executing and phasing the installation.

Completing Installation Worksheets

To streamline installation tasks, use the installation worksheet specific to your deployment scenario.

You may want to start using the worksheets during the design and planning stage. They might then be completed by the person performing the actual installation according to the design documentation you deliver.

Complete the worksheet for your chosen scenario. Obtain the Excel workbook file with the scenario worksheets by clicking: *../misc/SUP22_Worksheets.zip*.

See also

- *Performing the Installation* on page 27
- *Completing New and Upgrade Installations* on page 28
- *Adding Relay Servers or Reverse Proxies* on page 37
- *The Agentry Server in SAP Mobile Platform Clustered Environments* on page 71

Performing the Installation

Go to the Installation Guide for Runtime and locate the instructions for your chosen installation scenario. Use the information in the installation worksheet you filled out for your installation scenario to fill in the installer panels.

Prerequisites

Complete an installation worksheet for the Unwired Platform installation scenario you have chosen. You will use the information from this worksheet to make selections and enter configuration information when you run the Unwired Platform installer.

Task

1. The *Installation Guide for Runtime* has separate chapters for installing Unwired Platform according to each of the four installation scenarios:
   - *Installing Unwired Platform on a Single Server*

- *Installing Unwired Platform in a Simple Load-Balancing Cluster*
- *Installing Unwired Platform with a Standard Microsoft Failover Cluster*
- *Installing Unwired Platform with a Microsoft Failover Cluster with Shared Hosts*

2. After you complete the installation instructions for your Unwired Platform installation scenario in the *Installation Guide for Runtime*, return to this document to complete any postinstallation tasks.

   The *Installation Guide for Runtime* directs you to *Completing New and Upgrade Installations* on page 28

See also

- *Completing Installation Worksheets* on page 27
- *Completing New and Upgrade Installations* on page 28
- *Adding Relay Servers or Reverse Proxies* on page 37
- *The Agentry Server in SAP Mobile Platform Clustered Environments* on page 71

Completing New and Upgrade Installations

After completing a new or upgrade installation, perform any postinstallation tasks needed to make your Unwired Platform system fully functional.

See also

- *Completing Installation Worksheets* on page 27
- *Performing the Installation* on page 27
- *Adding Relay Servers or Reverse Proxies* on page 37
- *The Agentry Server in SAP Mobile Platform Clustered Environments* on page 71

Upgrade: Uninstalling Advantage Database Server

The upgrade from version 2.1 to version 2.2 leaves behind an installation of Advantage Database Server that the Unwired Platform Messaging Server no longer uses. After you verify that the database has migrated properly, you may uninstall this program.

In the upgrade to version 2.2, the Sybase Unwired Platform Messaging Server switched from Advantage Database Server to SQL Anywhere. The upgrade installer leaves the Advantage Database Server database in place, in case a problem occurs in migrating the data to SQL Anywhere. After you verify that the data migrated successfully, you can uninstall the Advantage Database Server and database.

1. Archive the Advantage Database Server data.

   Copy the entire contents of the Advantage Database Server data directory to the file system on a different hard drive or to other storage medium.

- On a single-server installation, the Advantage Database Server data is in `SUP_HOME\Servers\MessagingServer\Data\OBR`.
- In a cluster installation:
  - When the default data path used, Advantage Database Server data is under `SUP_HOME\Data\Messaging\OBR`.
  - When separate database file locations are specified, Advantage Database Server data is under `shared_data_path\Messaging\OBR`, where *shared_data_path* is the location you specified for the shared data path in your 2.1.x or earlier installation.
  - For Microsoft Failover Clusters, when separate database file locations are not specified, the Advantage Database Server data is under `shared_data_folder\Messaging\OBR`, where *shared_data_folder* is the location of the data folder on the share disk set up for the Microsoft cluster.

2. Uninstall the Advantage Database Server.
   a) Open the Windows Control Panel option to remove programs (for example, **Add or Remove Programs** or **Programs and Features**).
   b) Remove or uninstall **Advantage Database Server for Windows...** (name ending varies).

Upgrade: Restoring Customized Settings in Sybase Control Center Configuration Files

If you modified settings in Sybase Control Center configuration files in an existing Unwired Platform installation, the upgrade installer overwrites them and you must manually restore the customizations in the new files.

Unless you are certain that Sybase Control Center configuration files used only default settings before you upgraded, compare those files from your Unwired Platform backup with the same files after the upgrade, and manually restore any customized settings.

1. From the Windows Services Control Panel, stop the Sybase Control Center service.
2. In the backup you made of your Unwired Platform installation before upgrading, locate the following files:
   - `SUP_HOME\SCC-XX\bin\scc.properties`
   - `SUP_HOME\SCC-XX\services\Messaging\service-config.xml`
   - `SUP_HOME\SCC-XX\services\RMI\service-config.xml`
   - `SUP_HOME\SCC-XX\services\SCC\service-config.xml`
   - `SUP_HOME\SCC-XX\services\EmbeddedWebContainer\service-config.xml`
3. Locate the corresponding files in the upgraded Unwired Platform installation.
4. Copy any changed settings from the backup files into the new files, replacing any default values.

- Do not overwrite an entire Sybase Control Center configuration file with the corresponding file from the backup. You must manually and individually update specific settings in the new files.
- If you modified the `MaxFormContentSize` value before upgrading, its location has changed. Before upgrading, the setting was:

  ```
  -Dorg.eclipse.jetty.server.Request.maxFormContentSize
  ```

  in the *SUP_HOME*`\SCC-`*XX*`\bin\scc.properties` file.

  After upgrading, the setting is:

  ```
  jetty.maxFormContentSize
  ```

  in the *SUP_HOME*`\SCC-`*XX*`\services\EmbeddedWebContainer\service-config.xml` file.

a) Open each file from the upgraded Unwired Platform installation side-by-side with the corresponding file from the Unwired Platform backup.

b) Manually copy any changed settings from the backup file into the new file.

c) Save the updated new file.

5. From Windows Services, restart the Sybase Control Center service.

Enabling the Sample Database in a Production Installation

The Unwired Platform installer creates a Windows service (Sybase Unwired SampleDB) that enables the sample database (sampledb) if you install with a Personal or Enterprise Development license. If you have installed with an Enterprise Server (production) license and want the sample database to be accessible, you must run a script.

Development systems are typically kept separate from production systems. The sample database is provided for developers to use in a development system. The Enterprise Server license is for production systems, so the Unwired Platform installer does not create the Windows service that enables the sample database when you install Unwired Platform with an Enterprise Server license.

If you want the sample database to be available after you have installed with an Enterprise Server license, you can run a script to create the Windows service that enables the sample database server.

1. Verify that the sample database service does not already exist on the Unwired Server installation.

Open the Windows Services control panel and look for Sybase Unwired SampleDB.

2. If Sybase Unwired SampleDB does not exist:

a) In the file system where the Unwired Server is installed, go to the *SUP_HOME*`\Servers\UnwiredServer\bin` directory, where *SUP_HOME* is the Unwired Platform installation directory, down to the `UnwiredPlatform` folder.

b) Run the `sampledb.bat` script.

To create the service to start automatically, enter:

```
sampledb.bat install auto
```

To create the service to be started manually, enter:

```
sampledb.bat install manual
```

c) Start the Sybase Unwired SampleDB service you just created, either by using the Windows Services control panel, or by entering, at the command prompt:

```
sampledb.bat start
```

For more information on the **sampledb.bat** script, see *Create or Remove the Windows Service for sampledb Server (sampledb) Utility* in *System Administration*.

SAP Solution Manager

SAP Solution Manager provides tools that you can use to manage Sybase Unwired Platform as part of your overall SAP landscape.

Use Sybase Control Center to configure a connection from Unwired Server to SAP Solution Manager. Once connected, you can use the Solution Manager interface to view change records, as well as perform end-to-end traces, and exception and workload analysis.

For more detailed information about configuring SAP Solution Manager to be used in conjunction with Sybase Unwired Platform, see *Maintenance of Sybase Unwired Platform in the System Landscape*.

For complete SAP Solution Manager documentation, see *SAP Solution Manager Setup*.

Configuring SAP Solution Manager URL

Define and maintain a URL definition associated with an SAP Solution Manager instance for each application in the landscape. This endpoint is used to upload the business transaction XML generated by the client device platforms in an end-to-end trace session.

1. In the left navigation pane, select **Configuration**.
2. In the right administration pane, click the **General** tab.
3. From the menu bar, select **Components**.
4. Select **Solution Manager** and click **Properties**.
5. In the Solution Manager Component Property dialog, enter the URL associated with the appropriate SAP Solution manager.

Sybase Control Center Postinstallation Checklist

Sybase Control Center is the remote Unwired Platform runtime administration tool. By default, the installer configures Sybase Control Center automatically for the Unwired Platform environment.

Task	Complete?
To avoid security exceptions when launching Sybase Control Center, set up browser security certificates. See *Setting Up Browser Certificates for Sybase Control Center Connections* in *Sybase Control Center for Sybase Unwired Platform*.	
Log in to Sybase Control Center using the default supAdmin role with the password you configured during installation. See *Logging in to Sybase Control Center with an Installer-Defined Password* in *Sybase Control Center for Sybase Unwired Platform*.	
Confirm that all server nodes are visible in the left navigation pane. You must manually register any missing nodes, so they can be administered remotely. See *Adding or Updating Unwired Server Registration Properties* in *Sybase Control Center for Sybase Unwired Platform*.	
Replace the PreConfiguredUserLoginModule with a new security provider for the admin security configuration on the default domain. See *Making "Admin" Security Configuration Production-Ready* in *Security*.	

Security Postinstallation Checklist

Configuring security after installing runtime components is dependent upon the successful completion of Sybase Control Center postinstallation tasks. Perform the security postinstallation tasks once Sybase Control Center is functionally stable.

Task	Complete?
Secure the infrastructure of data tier components. See *Securing the Data Infrastructure* in the *Security* guide.	
Prepare the runtime environment according to your backup and recovery strategy, and secure the identified backup artifacts. See *Backup and Recovery* in the *System Administration* guide.	
Secure the data tier databases by changing default passwords and encrypted data in the database file. See *Securing Data Tier Databases* in the *Security* guide.	
(Upgrade) Create and map an SUP Push User logical role for each security configuration used to authorize incoming push notifications. See *Mapping DCN or Push Roles to a User Name Defined In PreconfiguredUserLoginModule* in the *Security* guide.	

Once these are complete, perform any other necessary security administration tasks. See *Securing Data in Motion Quick Start* and *Securing Access Quick Start* in *Security*.

EIS Driver and SSO Postinstallation Checklist

Because EIS drivers are used in both preproduction and production environments, their setup is time-sensitive. Before connecting to data sources from Unwired Platform, ensure that these drivers are installed and configured correctly.

Task	Comple-ted?
Download and install all required drivers and libraries for your EIS type.	
Configure the driver in both Sybase Control Center and Sybase Unwired WorkSpace - Mobile Business Object Development. See *Data Source Connections* in *System Administration*, and *Creating a Data Source Connection Profile* in *Sybase Unwired WorkSpace - Mobile Business Object Development*.	
If you are configuring a driver to use SSO, also install libraries, required security artifacts, and ensure the correct driver properties and values are configured. Remaining SSO tasks can be completed as part of routine security administration. See *Single Sign-on (SSO) Quick Start* in the *Security* guide.	

Preparing to Connect to JDBC Databases

To enable Unwired Server connections to Oracle, DB2, and Microsoft SQL Server databases, download the appropriate JDBC driver and install it on each Unwired Server host.

1. Download the JDBC driver.

JDBC driver	URL
Oracle	*http://www.oracle.com/technology/software/tech/java/sqlj_jdbc/index.html*
DB2	*http://www-306.ibm.com/software/data/db2/express/download.html*
SQL Server	*http://msdn.microsoft.com/en-us/data/aa937724.aspx*

2. Install the JDBC driver.
   a) Copy JDBC driver files to the `SUP_HOME\Servers\UnwiredServer\lib\3rdparty\` directory.
   b) Restart Unwired Server.
   c) Repeat these steps on each node in the Unwired Server cluster.

See also

- *Preparing to Connect to SAP using Java Connectors* on page 34
- *Preparing Your SAP Environment for Single Sign-on* on page 36

Preparing to Connect to SAP using Java Connectors

Unwired Server can use Java Connectors (JCo) to connect to the SAP EIS. With the correct security setup, you can also implement single sign-on (SSO) authentication.

Prerequisites

You must have an SAP account to access the SAP Web site and download libraries and utilities.

Task

After installing the required SAP files, see *Single Sign-on (SSO) Quick Start* in the *Security* guide.

See also

- *Preparing to Connect to JDBC Databases* on page 33
- *Preparing Your SAP Environment for Single Sign-on* on page 36

Installing the SAPCAR Utility

Unzip and install the latest **SAPCAR** utility on your Unwired Server or Sybase Unwired WorkSpace host. You can use **SAPCAR** to extract the contents of compressed SAP files, for example, RFC and cryptographic library files.

The installation package is available to authorized customers on the SAP Service Marketplace. There are different distribution packages for various hardware processors. Select the package appropriate for your platform.

1. Go to the SAP Web site at *http://service.sap.com/swdc* (login required).
2. From the SAP Download Center, navigate and log in to **Support Packages and Patches > Browse our Download Catalog > Additional Components**.
3. Select **SAPCAR**.
4. Select the current version, for example, **SAPCAR 7.20**, then download the appropriate **SAPCAR** for your platform.

See also

- *Installing the SAP Cryptographic Libraries* on page 35

Installing the SAP Cryptographic Libraries

Configure Secure Network Communications (SNC) for Unwired Server SAP JCo connections. SNC may be required by your SAP EIS, if you are using SSO2 tokens or X.509 certificates for connection authentication.

Prerequisites

Download and install the **SAPCAR** utility, which is required to extract the contents of the cryptographic library.

Task

Unzip and install the contents of the latest SAP Cryptographic archive on your Unwired Server host. There are different distribution packages for various hardware processors.

Make sure you are installing the correct libraries for your environment, and into folders based on the architecture of your machine.

1. Go to the SAP Web site at *http://service.sap.com/swdc* (requires login) and download the latest SAP cryptographic library suitable for your platform.
   a) Navigate to **Installations and Upgrades > Browse our Download Catalog > SAP Cryptographic Software > SAPCryptolib for Installation > SAPCRYPTOLIB <version>**.
   b) Select and download the platform-specific file.
2. Create a directory into which to unzip the Cryptographic zip file. For example: `C:\sapcryptolib`.
3. Copy the appropriate Windows cryptographic library for your machine (for example, SAPCRYPTOLIB<version>.SAR) to the `C:\sapcryptolib` directory.
4. Open a command prompt and navigate to `C:\sapcryptolib`.
5. Extract the SAR file. For example:

   ```
   SAPCAR_4-20002092.EXE -xvf C:\SAPCRYPTOLIB<version>.SAR -R C:\sapcryptolib
   ```
6. Copy the following into the `C:\sapcryptolib` directory:
   - For Itanium 64-bit processors, copy the `ntia64` subdirectory contents.
   - For Intel 64-bit processors, copy the `nt-x86_64` subdirectory contents.
   - For Intel 32-bit processors, copy the `ntintel` subdirectory contents.
7. Delete the corresponding subdirectory when files have been moved.
8. (Optional) Add the SECUDIR environment variable to the user environment batch file: *SUP_HOME*`\Servers\UnwiredServer\bin\usersetenv.bat`.
9. If you have installed Sybase Mobile SDK, you must add the SECUDIR variable to the following batch file: *SUP_HOME*`\MobileSDK<version>\Eclipse\MobileWorkSpace.bat`.

See also

- *Installing the SAPCAR Utility* on page 34

Preparing Your SAP Environment for Single Sign-on

Verify that the SAP enterprise information system (EIS) is configured correctly to accept SSO connections from Unwired Server.

1. Set all parameters for the type of credentials accepted by the server:
   - SSO2 token – verify everything is set properly with the SSO2 transaction.
   - X.509 certificate – set up, import, and verify certificates using the Trust Manager (transaction STRUST).
2. Use the ICM configuration utility to enable the ICM HTTPS port.
3. Set the type of authentication to enable communication over HTTPS.
   - Server authentication only – the server expects the client to authenticate itself using basic authentication, not SSL
   - Client authentication only – the server requires the client to send authentication information using SSL certificates. The ABAP stack supports both options. Configure the server to use SSL with client authentication by setting the ICM/HTTPS/verify_client parameter:
     - 0 – do not use certificates.
     - 1 – allow certificates (default).
     - 2 – require certificates.
4. Use the Trust Manager (transaction STRUST) for each PSE (SSL server PSE and SSL client PSE) to make the server's digitally signed public-key certificates available. Use a public key-infrastructure (PKI) to get the certificates signed and into the SAP system.

   There are no SSO access restrictions for MBO data that span multiple SAP servers.

   See SAP product documentation at *http://help.sap.com/saphelp_aii710/helpdata/en/49/23501ebf5a1902e10000000a42189c/frameset.htm* for information about the SAP Trust Manager.
5. To enable secure communication, Unwired Server and the SAP server that it communicates with must exchange valid CA X.509 certificates. Deploy these certificates, which are used during the SSL handshake with the SAP server, into the Unwired Server truststore.
6. The user identification (distinguished name), specified in the certificate must map to a valid user ID in the AS ABAP, which is maintained by the transaction SM30 using table view (VUSREXTID).

See *Configuring the AS ABAP for Supporting SSL* at *http://help.sap.com/saphelp_aii710/helpdata/en/49/23501ebf5a1902e10000000a42189c/frameset.htm*

See also

- *Preparing to Connect to JDBC Databases* on page 33
- *Preparing to Connect to SAP using Java Connectors* on page 34

Adding Relay Servers or Reverse Proxies

Once the installation of the Unwired Platform cluster is complete, install and configure either Relay Server or a reverse proxy, depending on the option you have selected during the design stage.

For Relay Server, you can use either the Sybase Hosted Relay Service or installed Relay Server binaries. For third-party reverse proxy solutions, Sybase currently recommends Apache Reverse Proxy.

See also

- *Completing Installation Worksheets* on page 27
- *Performing the Installation* on page 27
- *Completing New and Upgrade Installations* on page 28
- *The Agentry Server in SAP Mobile Platform Clustered Environments* on page 71

Using Sybase Hosted Relay Service for Testing

The Sybase Hosted Relay Service is an alternative to local Relay Server installation, for temporary use with development and test systems only. It is particularly suitable for a personal Unwired Platform system.

Prerequisites

- All Unwired Servers and data tier servers must be installed and running.
- The Unwired Server cluster and its nodes must be registered in Sybase Control Center.

Note: If the cluster or server name does not appear in the navigation pane, on the SCC console, you must register them with Sybase Control Center.

Task

Subscribe online to the Sybase Hosted Relay Service, and configure your Unwired Platform system with the information you provide during subscription.

1. Register Unwired Server with the relay service.

   a) Register or log in to the Sybase Hosted Relay Service at *https://relayserver03.sybase.com/ias_relay_server/account/index.php*.

      Complete any mandatory fields, then click **Submit**.

   b) From the navigation bar on the left, click **Manage Account**.

   c) Click **Add New Sybase Unwired Platform Farm**.

      Create one or more farms as required by your development or test environment.

- Select at least one farm type.
- Select **DCN farm** only if you are registering a scale-out node.
- Select **MBS farm** for Hybrid Web Container applications.
- Enter the farm name, which serves as the farm ID in Sybase Control Center. The suffix `RBS` or `MBS` is appended to the end of the farm name, depending on the farm type you select.
- Enter the server name, which is used as the server node ID in Sybase Control Center. The server name can contain only alphanumeric characters.

d) Click **Create Farm**.

e) Click **Configuration Instructions** from the confirmation message.

Keep this page open, or make a copy of these details so you have them available for further configuration tasks in Sybase Control Center and on the client devices.

2. Use Sybase Control Center to register the hosted relay service as a Relay Server.

a) Click the Sybase Unwired Platform cluster, and open the **Relay Servers** tab, then click **New**.

b) Enter general configuration information from the configuration instructions, then click **Next**.

Host	relayserver.sybase.com
HTTP port	80
HTTPS port	443

c) Enter the server farm (Unwired Server cluster) information.

Farm ID	Copy the farm name from the configuration instructions
Type	Messaging or Replication

d) Click **+**, then click the **farm ID** field.

e) Enter the node ID.

Use the server name you registered with the hosted relay service.

f) Enter the token.

Copy the token string from the configuration instructions and paste it in the field.

g) Click **+** to add the server node to the list, then **Finish**.

3. Create outbound enablers (RSOEs) to connect with the hosted relay service.

a) In the left pane, under **Servers > <*Mobile Server name*>**, select **Server Configuration**.

b) Select the **Outbound Enabler** tab.

c) Click **+ New** to create the RSOEs.

d) Select the RSOE details, then click **Finish**.

4. Start all RSOEs.

a) Select some or all RSOEs, then click **Start**.

The Status column should show `Running`.

b) Select one or more RSOEs, then click **Retrieve Log**.

Review log messages to ensure each RSOE is running correctly.

Record the connection property values shown on the Configuration Instructions page to share with developers and device users.

Developers must use those values to configure an Unwired Server connection profile, and to set values in the Connection screen of a mobile application.

Installing Relay Server for Production Environments

A Relay Server supports most environments and application types, including those applications connecting as an HTTP client.

1. *Installing a Relay Server*

   Install each Relay Server instance on a Web server host, on the DMZ subnet.
2. *Configuring Relay Servers and Outbound Enablers*

   Configure Relay Servers and outbound enablers (OEs) to support load balancing in an Unwired Server cluster.

Installing a Relay Server

Install each Relay Server instance on a Web server host, on the DMZ subnet.

Prerequisites

You must provision an appropriate Web server host for each Relay Server.

See also

- *Configuring Relay Servers and Outbound Enablers* on page 46

Installing Relay Server on Apache

Install Relay Server executables and libraries on an Apache HTTP Server (Linux) host.

Relay Server executables and libraries are supplied in an archive file, located on the installation media at: `modules\relayserver\`.

1. Identify the appropriate archive for the Apache host architecture.
   - 32-bit system – `relayserver_linux_x86.tar.gz`
   - 64-bit system – `relayserver_linux_x64.tar.gz`
2. Copy the Relay Server archive file to the Apache host, and extract the archive into a Relay Server installation directory.

   For example: `/usr/local/relayserver/`
3. Copy the following files from the Relay Server installation to the Apache `modules/` directory:

- `dbfhide`
- `dblgen12.res`
- `dbsupport`
- `libdbicu12_r.so`
- `libdbicudt12.so`
- `libdblib12.so`
- `libdblib12_r.so`
- `libdbtasks12.so`
- `mod_rs_ap_admin.so`
- `mod_rs_ap_client.so`
- `mod_rs_ap_monitor.so`
- `mod_rs_ap_server.so`
- `rshost`

Note: Because of Apache requirements, you cannot configure Apache for Relay Server immediately after installation. You must first configure the Outbound Enablers. Apache configuration is covered in *Configuring Apache for Relay Server* on page 40.

Configuring Apache for Relay Server

Modify the Apache HTTP Server configuration and environment, as needed for Relay Server.

Prerequisites

Create a Relay Server configuration file and deploy it on the Relay Server (Apache) host.

Task

Edit the Apache `httpd.conf` and `envvars` files to:

- Load Relay Server client and server modules
- Define locations and handlers for the client and server modules
- Increase the number of concurrent clients (if necessary)
- Set environment variables required by Relay Server executables

1. Open `httpd.conf` in a text editor.

a) To load Relay Server modules, add:

```
LoadModule iarelayserver_client_module modules/
mod_rs_ap_client.so
LoadModule iarelayserver_server_module modules/
mod_rs_ap_server.so
```

a) To define a LocationMatch for the Relay Server client module, add:

```
<LocationMatch /cli/iarelayserver/* >
    SetHandler iarelayserver-client-handler
</LocationMatch>
```

b) To define a Location for the Relay Server server module, add:

```
<Location /srv/iarelayserver/* >
    SetHandler iarelayserver-server-handler
    RSConfigFile "/apache-install/modules/rs.config"
</Location>
```

The server module Location must match the server URL suffix specified in the Relay Server configuration file.

The RSConfigFile directive specifies the location of the Relay Server configuration file, which must reside in the same directory as the State Manager executable (rshost).

c) (Optional) To increase the maximum number of concurrent clients, if necessary, add.

```
ServerLimit 1000
MaxClient 1000
```

By default, Relay Server on Apache is configured for 100 concurrent device users. If you need more than that, set the ServerLimit and MaxClient directives to an appropriate value.

2. Open `envvars` in a text editor.

a) To set and export environment variables required for Relay Server executables, add:

```
path="$path:/apache-install/modules"
export $path
LD_LIBRARY_PATH="$LD_LIBRARY_PATH:/apache-install/modules"
export $LD_LIBRARY_PATH
```

b) Determine if one of the following environment variables are set globally: TMP, TMPDIR, or TEMP.

If none of those variables is set globally, or to save the default Relay Server log file in another specific directory, set and export the TMP variable to point to the log file location.

Note: The Apache user process must have write permission in the directory specified by $TMP.

Next

Restart the Apache HTTP Server after you make the configuration changes.

Interactively Installing Relay Server on IIS with Scripts

(Recommended) Use quick setup scripts to interactively install Relay Server. Quick setup can be less error-prone than manual installations.

Prerequisites

Follow the prerequisites identified in the quick setup script. You cannot install Relay Server until the script verifies that the prerequisites have been met.

Task

Output of this setup script is saved to `rs-setup.log`. The existing `rs-setup.log`, IIS metabase, and Relay Server configuration files are backed up automatically.

1. Locate the quick setup script for your version of IIS, and review the `readme.txt` file for your IIS version.
   - Launch `rs-setup.bat` for IIS 6 from *SUP_HOME*`\Servers\SQLAnywhere12\MobiLink\relayserver\IIS\QuickSetup_IIS6`. For information about this script, see *http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.help.sqlanywhere.12.0.1/relayserver/ml-relayserver-s-5692444.html*.
   - Launch `rs-setup.bat` for IIS 7 from *SUP_HOME*`\Servers\SQLAnywhere12\MobiLink\relayserver\IIS\QuickSetup_IIS7`. For information about this script, see *http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.help.sqlanywhere.12.0.1/relayserver/ml-relayserver-s-5692444a.html*
2. Follow the prompts to install files in the correct location and to configure IIS for Relay Server use.

   The script guides you through:
   - IIS customization
   - Backup creation
   - Installation and Relay Server startup
   - Generation and launch of a Quick Reference document
   - Generation and launch of a status page
   - Launch of a SimpleTestApp client

Manually Installing Relay Server on IIS

Perform prerequisites, then install Relay Server binaries on an IIS host. Configuration steps vary, depending on whether you are using an IIS version 6 or 7 host.

Installing Required IIS Components

You must enable certain roles and features in IIS for Relay Server to function correctly.

1. Open IIS Server Manager.
2. Verify that the IIS Role is enabled.
3. Once the IIS Role is enabled, ensure the following features are installed:
   - Web Server Service
   - Common HTTP Features
   - Static Content
   - Default Document
   - Directory Browsing

- HTTP Errors
- ISAPI Extensions
- HTTP Logging
- Request Monitor
- Request Filtering
- Static Content Compression
- IIS Management Console
- IIS Management Scripts and Tool
- (IIS 7 only) IIS 6 Management Compatibility
- (IIS 7 only) IIS 6 Metabase Compatibility
- (IIS 7 only) IIS 6 WMI Compatibility
- (IIS 7 only) IIS 6 Scripting Tools
- (IIS 7 only) IIS 6 Management Console

Install any missing features.

4. Restart the IIS host.

Installing Relay Server Binaries on an IIS Host

Install Relay Server executables and libraries on an IIS host.

Relay Server executables and libraries are supplied in an archive file, located on the installation media at: `modules\relayserver\`

1. Identify the appropriate archive for the IIS host architecture.
   - 32-bit system — `relayserver.zip`
   - 64-bit system — `relayserver_x64.zip`
2. Copy the Relay Server archive file to the IIS host.
3. Extract all files and folders from the archive to the `wwwroot\` directory.

   The following subdirectories are created:

   ```
   wwwroot\ias_relay_server\
   wwwroot\ias_relay_server\Client\
   wwwroot\ias_relay_server\Server\
   ```
4. Modify the system Path variable on the IIS host to include the `ias_relay_server\Server\` directory.

Configuring IIS 7 for Relay Server

Configure IIS 7 to host a Relay Server.

Note: This task configures IIS for anonymous access to Relay Server. Configure appropriate security for IIS and Relay Server, based on your business requirements.

1. **Back up the** `applicationHost.config` file (usually located in the `System32\inetsrv\config\` directory).
2. In a text editor, open `applicationHost.config`.
3. Create a Relay Server application pool.

   Insert the following snippet in the `<applicationPools>` collection:

   ```
   <add name="RelayServer" queueLength="65535" autoStart="true"
          managedRuntimeVersion="" managedPipelineMode="Integrated">
       <processModel identityType="LocalSystem"
   idleTimeout="00:00:00"
               maxProcesses="20" pingingEnabled="false"
              pingInterval="00:00:30" pingResponseTime="00:01:30" />
       <recycling disallowOverlappingRotation="true">
           <periodicRestart time="00:00:00">
               <schedule>
                   <clear />
               </schedule>
           </periodicRestart>
       </recycling>
       <failure rapidFailProtection="false" />
       <cpu resetInterval="00:00:00" />
   </add>
   ```
4. Add the Relay Server application to the default Web site.

   Insert the following snippet in the `<site name="Default Web Site">` element:

   ```
   <application path="/ias_relay_Server"
   applicationPool="RelayServer">
       <virtualDirectory path="/"
               physicalPath="C:\Inetpub\wwwroot\ias_relay_server" />
   </application>
   ```
5. Enable Web extensions for Relay Server.

   Insert the following snippet in the `<isapiCgiRestriction>` collection.

   ```
   <add path="C:\Inetpub\wwwroot\ias_relay_server\Client
   \rs_client.dll"
           allowed="true" />
   <add path="C:\Inetpub\wwwroot\ias_relay_server\Server
   \rs_server.dll"
           allowed="true" />
   ```
6. Add Relay Server locations to the default Web site.

   Insert the following snippet in the `<configuration>` element.

   ```
   <location path="Default Web Site/ias_relay_server/client">
       <system.webServer>
           <handlers accessPolicy="Execute, Script">
           </handlers>
       </system.webServer>
   ```

```
</location>

<location path="Default Web Site/ias_relay_server/server">
    <system.webServer>
        <handlers accessPolicy="Execute, Script">
        </handlers>
    </system.webServer>
</location>

<location path="Default Web Site/ias_relay_server">
    <system.webServer>
        <security>
            <authentication>
                <anonymousAuthentication userName="" />
            </authentication>
            <requestFiltering>
                <requestLimits
maxAllowedContentLength="2147483647" />
            </requestFiltering>
        </security>
    </system.webServer>
</location>
```

7. Save your changes.
8. Open a Web browser, and confirm that `http://localhost:80` loads the default page correctly.

Configuring IIS 6 for Relay Server

Use the IIS Manager Console to configure IIS 6 for Relay Server.

1. Start the IIS Manager Console.
2. Create a Relay Server application pool.
   a) Right-click **Application Pools** and create a new application pool.
   b) Right-click the newly created application pool and select **Properties** to edit its properties.
   c) Open the **Performance** tab, and deselect **Shutdown Worker Processes After Being Idle**.
   d) Open the **Recycling** tab, and deselect **Recycle Worker Processes (In Minutes)**.
3. Enable Web extensions for Relay Server.
   a) Right-click the newly created Web site, `ias_relay_server`, and select **Properties** to edit its properties.
   b) Open the **Directory** tab.
   c) Set execute permissions to **Scripts And Executables**.
   d) Click **Create under Application Settings**.
   e) Select the Relay Server application pool you created.

f) Under **Web Service Extensions**, select **Add New Web Service Extensions**, enter Extension Name and Request Files, and select **Set Extension Status to Allowed**, to allow both `rs_server.dll` and `rs_client.dll` to be run as ISAPI.

4. Configure IIS for Unwired Platform Runtime device clients to communicate with Relay Server:

a) Navigate to `\Inetpub\AdminScripts`.

b) Run the following console command:

```
cscript adsutil.vbs set w3svc/1/uploadreadaheadsize 0
iisreset
```

If you do not perform this configuration step, you see:

```
Could not connect to the Server. Session did not complete.
```

5. Enable anonymous access, using an appropriate user name and password for an administrative group, or using `build-user IUSR_%computername%` for directory security.

Grant permission for the user to access the IIS metabase:

```
C:\Windows\Microsoft.Net\Framework\<Version>
\aspnet_regiis.exe -ga IUSR_%computername%
```

Configuring Relay Servers and Outbound Enablers

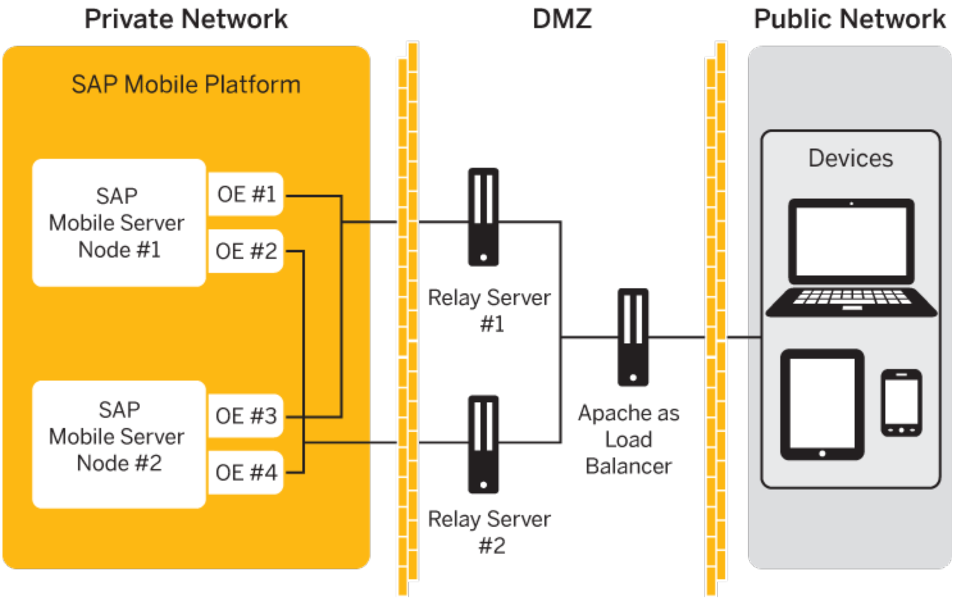
Configure Relay Servers and outbound enablers (OEs) to support load balancing in an Unwired Server cluster.

Prerequisites

- All Unwired Servers and data tier servers must be installed and running.
- The Unwired Server cluster and its nodes must be registered in Sybase Control Center.

Note: If the cluster or server name do not appear in the navigation pane, on the SCC console, you must register them with Sybase Control Center.

Task



The diagram above illustrates an Unwired Platform Runtime cluster with two Unwired Server nodes, using two Relay Servers, with Apache acting as a load balancer. This document focuses on this configuration, while providing information on what to do differently to set up different configurations, for example:

- More than two Relay Servers
- Hardware load balancer in place of Apache

See also

- *Installing a Relay Server* on page 39

Configuring Unwired Server to use Relay Server

Choose a method for configuring Unwired Server to use Relay Server, then generate a Relay Server configuration file. Copy the file to the Relay Server host, and distribute the same configuration file to multiple Relay Server nodes.

This task applies only to a Relay Server installed on the LAN. It does not apply to the Sybase Hosted Relay Server.

Note: If you are creating a custom Relay Server configuration, go to *Creating a Custom Relay Server Configuration* on page 49.

If you are using a quick configuration, continue with *Creating a Quick Configuration* on page 48.

Creating a Quick Configuration

Create a Relay Server configuration primarily with system defaults, and create outbound enabler (OE) processes for each Unwired Server.

1. In the navigation pane, click the Unwired Server cluster name.
2. In the administration pane, click the **Relay Servers** tab.
3. Click **Quick Configure**.
4. Specify these property values:

   Values vary for load balanced environments. If you do not configure load balancer values, outbound enablers bypass the load balancer and high availability is compromised if a direct Relay Server connection fails.

   - **Host –** if the Relay Server farm has a load balancer in front of it, the host name or IP address of the load balancer. Otherwise, the host name or IP address of a single Relay Server.
   - **HTTP port –** if the Relay Server farm has a load balancer in front of it, the port of the load balancer. Otherwise, the Relay Server HTTP port.
   - **HTTPS port –** if the Relay Server farm has a load balancer in front of it, the port of the load balancer. Otherwise, the Relay Server HTTPS port.
   - **URL suffix –** the URL suffix used by the Outbound Enabler to connect to a Relay Server. The value you set depends on whether Relay Server is installed on IIS or Apache hosts. For IIS, use `/ias_relay_server/server/rs_server.dll` . For Apache use`/srv/iarelayserver/`.
   - **Replication or Messaging or Web Service (for scale-out nodes) farm token –** the security token used by the Outbound Enabler to authenticate its connection with the Relay Server. Assign a token string (up to 2048 characters); one token can be shared by all farm types. The replication and messaging farm token values can be the same.
   - **(Optional) Description –** a user-defined description of the Relay Server.
5. (Optional) Select **Advanced settings** and specify these property values:
   - **HTTP user –** user name for OE authentication on the Web server (Relay Server host).
   - **HTTP password –** password for OE authentication on the Web server.
6. (Optional) Configure connection values to required Internet proxy servers:
   - **Proxy server host –** host name of the Internet proxy server.
   - **Proxy server port –** connection port on the Internet proxy server.
   - **HTTP proxy user –** user name for OE authentication on the Internet proxy server.
   - **HTTP proxy password –** password for OE authentication on the Internet proxy server.
7. Click **OK** to generate a Relay Server configuration file, and the OE processes for each Unwired Server.

Properties in the `[backend_farm]` and `[backend_server]` sections are populated automatically, based on the Unwired Server cluster name and host name.

An outbound enabler instance is automatically created for the RBS and MBS synchronization ports, and for each enabled HTTP/HTTPS port for the Unwired Server host. For scale-out nodes, an outbound enabler instance is automatically created for each enabled HTTP/S port. The ports are not started.

Next

Review the values in the Relay Server configuration file, and edit if necessary.

Continue with *Generating and Modifying Relay Server Configuration File* on page 51.

Creating a Custom Relay Server Configuration

Create a Relay Server configuration by specifying all configuration property values.

1. *Launching the Relay Server Configuration Wizard*

   Launch the Relay Server Configuration wizard to create a configuration file with customized property values.
2. *Setting Relay Server General Properties*

   Set basic connection properties for the Relay Server.
3. *Defining Server Farms and Cluster Nodes*

   Set connection properties for the Unwired Server cluster and its constituent nodes.

Launching the Relay Server Configuration Wizard

Launch the Relay Server Configuration wizard to create a configuration file with customized property values.

1. In the navigation pane, click the Unwired Server cluster name.
2. In the administration pane, click the **Relay Servers** tab.
3. Click **New**.

Setting Relay Server General Properties

Set basic connection properties for the Relay Server.

Prerequisites

Launch the Relay Server configuration wizard.

Task

1. Specify property values.

   Configure values for the load balancer that is in front of the Relay Server farm. Values vary for load balanced environments. If you do not configure load balancer values, outbound enablers bypass the load balancer and high availability is compromised if a direct Relay Server connection fails.

- **Host –** if the Relay Server farm has a load balancer in front of it, the host name or IP address of the load balancer. Otherwise, the host name or IP address of a single Relay Server.
- **HTTP port –** if the Relay Server farm has a load balancer in front of it, the port of the load balancer. Otherwise, the Relay Server HTTP port.
- **HTTPS port –** if the Relay Server farm has a load balancer in front of it, the port of the load balancer. Otherwise, the Relay Server HTTPS port.

  For IIS, the value identifies the *relative* path for `rs_client.dll`. If your IIS directory structure is different, modify this value accordingly.

  Note: If Relay Server uses HTTPS and certificates, clients other than those using replication-based synchronization may not be able to connect: messaging applications support only HTTP, and Hybrid Web Container applications for iOS support HTTPS, but not certificates.
- **URL suffix –** the URL suffix used by the Outbound Enabler to connect to a Relay Server. The value you set depends on whether Relay Server is installed on IIS or Apache hosts. For IIS, use `/ias_relay_server/server/rs_server.dll` . For Apache use`/srv/iarelayserver/`.

  For IIS, the value identifies the *relative* path for `rs_client.dll`. If your IIS directory structure is different, modify this value accordingly.

  Note: For IIS, the value identifies the *relative* path for `rs_client.dll`. If your IIS directory structure is different, modify this value accordingly.

  For IIS, the value identifies the *relative* path for `rs_client.dll`. If your IIS directory structure is different, modify this value accordingly.
- **(Optional) Description –** a user-defined description of the Relay Server.

2. Add or remove HTTP credentials as required:

a) Select **Configure relay server HTTP credentials**.

b) To add new credentials, specify these property values and click **+**:

- **User name –** user name for RSOE authentication on the Web server (Relay Server host).
- **Password –** password for RSOE authentication on the Web server.

c) To remove credentials from the list, select the corresponding user name, then click **X**.

3. Click **Next**.

Defining Server Farms and Cluster Nodes

Set connection properties for the Unwired Server cluster and its constituent nodes.

1. Define the Unwired Server cluster.
   a) Specify these property values:
      - **Farm ID –** a string that identifies the Unwired Server cluster for which the Relay Server manages requests. This property is case-sensitive, and must match the value in the Outbound Enabler configuration.
      - **Type –** the type of request managed by the Relay Server: Replication, Messaging or Webservice protocol. When configuring Relay Server Outbound Enabler properties for a scale-out node, you can select only the Webservice farm type.
      - **(Optional) Description –** user-defined description for the Unwired Server cluster.

   b) Click **+**.
   c) Repeat steps 1 and 2 to add multiple Unwired Server clusters.
   d) To delete a configured Unwired Server cluster, select it in the list, then click the **X** button.
2. Identify each Unwired Server instance in the cluster.
   a) Select an existing Unwired Server cluster.
   b) Specify these property values:
      - **Node ID –** a string that identifies the Unwired Server in the cluster. This property is case-sensitive, and it must match the value in the RSOE configuration.
      - **Token –** the security token used by the Outbound Enabler to authenticate its connection with the Relay Server. Assign a token string (up to 2048 characters); one token can be shared by all farm types.

   c) Click **+**.
   d) Repeat steps 1 and 2 to add Unwired Server cluster nodes.
   e) To delete a configured Unwired Server node, select it in the list and click **X**.
3. Click **Next** to review your settings, or click **Finish** to exit the wizard.

   Note: After you exit the wizard, generate the Relay Server configuration file, and copy it to each Relay Server instance to update configuration for multiple Relay Servers.

The Relay Server is registered with Sybase Control Center, and can be managed from the Relay Servers tab for the Unwired Server cluster.

Generating and Modifying the Relay Server Configuration File

Generate all or part of a Relay Server configuration file. Then transfer the generated file to all Relay Server hosts.

Generating a configuration file extracts the property values stored in the cluster database during the configuration process, and writes them to a file. You may still need to edit this file.

1. In the navigation pane, click the Unwired Server cluster name.
2. In the administration pane, click the **Relay Servers** tab.
3. Click **Generate**.
4. Choose **Relay server configuration file**.
5. Select the parts of the file to generate:
   - The entire Relay Server configuration
   - A server node definition
   - A farm definition
6. Click **Next**, then click **Finish**.
7. Select an output target for the file.
8. Manually edit the file if necessary, and save the changes.
   For details on other manual edits that you can perform, see the Relay Server documentation at *http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.help.sqlanywhere.12.0.1/relayserver/relayserver12.html*.
9. To configure a Relay Server farm, apply the same changes to the configurations of remaining farm members. The configuration among all members must be identical.

Sample Relay Server Configuration File

A sample `rs.config` file for an Unwired Platform cluster with two Unwired Server nodes and two Relay Servers.

This is an example of an `rs.config` file you might generate for two Relay Servers that support an Unwired Platform cluster made up of two Unwired Servers. After generating it, you would copy it to each Relay Server host and use it to update the Relay Server configuration.

```
#--------------------
# Relay server peers
#--------------------
[relay_server]
enable          = yes
host            = 10.172.155.150
http_port       = 80
https_port      = 443
description     = Machine #1 in RS farm

[relay_server]
enable          = yes
host            = 10.172.148.40
http_port       = 5011
https_port      = 443
description     = Machine #2 in RS farm


#---------------
# Backend farms
#---------------
[backend_farm]
```

```
enable          = yes
id              = supqa-serv012.obqastress2
client_security = off
backend_security= off
description     = supqa-serv012.obqastress2

description     = supqa-serv012.obqastress2
#-----------------
# Backend servers
#-----------------
#supqa-serv01
[backend_server]
enable   = yes
farm     = supqa-serv012.obqastress2
id       = supqa-serv01
token    = MBS

[backend_server]
enable   = yes
farm     = supqa-serv012.obqastress2
id       = supqa-serv011
token    = MBS

#supqa-serv02
[backend_server]
enable   = yes
farm     = supqa-serv012.obqastress2
id       = supqa-serv02
token    = MBS

[backend_server]
enable   = yes
farm     = supqa-serv012.obqastress2
id       = supqa-serv021
token    = MBS
```

Deploying a Relay Server Configuration File

After you generate a Relay Server configuration file, you must copy it to each Relay Server host, to update the Relay Server configuration. All Relay Servers in a cluster Unwired Platform installation must use identical copies of the Relay Server configuration file, `rs.config`.

Prerequisites

- All Unwired Servers and data tier servers must be installed and running.
- The Unwired Server cluster and at least one node must be registered in Sybase Control Center.
- At least one Relay Server must be registered in Sybase Control Center .
- A complete configuration file must be generated.

Task

1. Edit the generated configuration file, if necessary to refine property values in the generated Relay Server configuration file.

   For complete reference details on Relay Server configuration properties, see *http://infocenter.sybase.com/help/topic/com.sybase.help.sqlanywhere.12.0.1/relayserver/ml-relayserver-config-file.html*.
2. Place the new `rs.config` in the same directory as `rshost.exe`.
3. To update an existing Relay Server with the new configuration, run:

   ```
   rshost –u –f Path\rs.config
   ```

   For example, on IIS, using the default configuration file location, the command is:

   ```
   rshost –u –f C:\RelayServer\SQLAnywhere12\MobiLink\relayserver
   \IIS\Bin64\Server\rs.config
   ```

Configuring the Outbound Enablers

Set up one or more outbound enablers (OEs) for each Unwired Server, connecting to the load balancer, as identified in a Relay Server configuration.

Prerequisites

- At least one Relay Server must be registered in Sybase Control Center.
- A complete configuration must be defined.

Task

1. *Separating the Processing of Data Services*

   You must always separate processing for different data services (that is, either messaging, replication, or HTTPS protocols) by setting up a separate Relay Servers and outbound enablers for each protocol.
2. *Configuring RSOE General Properties*

   Set general RSOE configuration properties to define the context in which the RSOE process operates.
3. *Configuring RSOE Connection Settings*

   Set connection configuration properties for an RSOE. These properties define the RSOE connection to the Relay Server.
4. *Configuring RSOE Start Options*

   Configure start options for RSOE.
5. *Generating the Relay Server Outbound Enabler Configuration File*

   To quickly and easily replicate a common outbound enabler (RSOE) configuration to multiple hosts, generate an RSOE configuration file.

Separating the Processing of Data Services

You must always separate processing for different data services (that is, either messaging, replication, or HTTPS protocols) by setting up a separate Relay Servers and outbound enablers for each protocol.

1. Create separate Relay Server farms for applications using messaging-based synchronization (MBS), replication-based synchronization (RBS), and HTTPS protocols.

   See *Creating a Custom Relay Server Configuration* on page 49, *Generating and Modifying the Relay Server Configuration* on page 51, and *Deploying a Relay Server Configuration* on page 53.
2. Set up outbound enablers for each farm you create.

   Set the Farm type to:
   - Messaging Relay Servers to handle messaging data processing.
   - Replication for Relay Servers to handle replication synchronization.
   - Scale-out Node for Relay Servers that handle HTTPS- based data processing and messaging for Web Services clients.

Configuring RSOE General Properties

Set general RSOE configuration properties to define the context in which the RSOE process operates.

1. In the navigation pane, click **Servers > <*ServerNode*>**.
2. In the administration pane, select the Outbound Enabler tab, then click **New**.
3. Specify these property values:
   - **Farm type –** select the type of request managed by the Relay Server: Replication, Messaging or Webservice protocol. When configuring Relay Server Outbound Enabler properties for a scale-out node, you can select only the Webservice farm type.
   - **Mobile Server port –** select the port on which RSOE manages requests.
   - **Relay server host –** if the Relay Server farm has a load balancer in front of it, the host name or IP address of the load balancer. Otherwise, the host name or IP address of a single Relay Server.
   - **Relay server port –** for Relay Server farms that use a load balancer, the port of the load balancer. Otherwise, the Relay Server HTTP or HTTPS port.
   - **Mobile Server farm –** select the string that identifies the Unwired Server cluster, for which the Relay Server manages requests. This property is case-sensitive, and it must match the value in the Relay Server configuration.
   - **Server node ID –** select the string that identifies the Unwired Server in the cluster. This property is case-sensitive, and must match the value in the Relay Server configuration.
4. Click **Next**.

Configuring RSOE Connection Settings

Set connection configuration properties for an RSOE. These properties define the RSOE connection to the Relay Server.

1. Configure SSL connection options:
   - **Server Authentication –** select this option if you want Relay Server authentication for the SSL connection.
   - **Mutual Authentication –** select this option if you want mutual authentication for the SSL connection.
   - **Key Alias –** this option is only enabled if you selected mutual authentication. Select an outbound enabled identify key alias whose public certificate is trusted by the Relay Server.
2. Specify these property values:
   - **Certificate file –** select this option and choose the `.CRT` file used to authenticate the RSOE to Relay Server. You can choose this file only if you have already loaded it into the Unwired Server certificate store and your Relay Server Port selection is HTTPS: 443 in General Properties.
3. Specify these property values:
   - **HTTP user –** select the user name for RSOE authentication on the Web server (Relay Server host).
   - **HTTP password –** enter the password for RSOE authentication on the Web server.
4. If RSOE connections to the Relay Server must pass through an Internet proxy server, specify these property values:
   - **Proxy server –** select the Internet proxy server.
   - **HTTP proxy user –** select the user name for RSOE authentication on the proxy server.
   - **HTTP proxy password –** type the password for RSOE authentication on the proxy server.

Configuring RSOE Start Options

Configure start options for RSOE.

1. Enable an option:
   a) Select the box that corresponds to each name.
   b) Set a value.
2. Click **OK**.
3. Ensure the process starts by viewing the Status column of the Outbound Enablers tab.

See also

- *Generating the Relay Server Outbound Enabler Configuration File* on page 58

Outbound Enabler Start Options Reference

Review available outbound enabler start options, which affect outbound enabler logging. Each outbound enabler has its own log file that you can retrieve in Sybase Control Center.

Option	Default	Description
Verbosity level	0	Sets log file verbosity values: • 0 – log errors only. Use this logging level for deployment. • 1 – session-level logging. This is a higher level view of a session. • 2 – request-level logging. Provides a more detailed view of HTTP requests within a session. • 3 - 5 – detailed logging. Used primarily by Technical Support.
Reconnect delay	5	Delay before retry after connection fails.
Maximum output file size	10KB	Maximum log file size.
Truncate log file	None	Delete the log file at RSOE startup.
Advanced	None	User-defined value for start parameters. See *Outbound Enabler* in *SQL Anywhere 12.0.1* at *http://infocenter.sybase.com/help/index.jsp?topic=/com.sybase.help.sqlanywhere.12.0.1/relayserver/ml-relayservers-6039420.html* .

Generating the Relay Server Outbound Enabler Configuration File

To quickly and easily replicate a common outbound enabler (RSOE) configuration to multiple hosts, generate an RSOE configuration file.

Administrators can use Sybase Control Center to configure an initial RSOE for development. Once a configuration proves valid and stable, the administrator can generate the RSOE configuration file, then use `regRelayServer.bat` to apply it to Unwired Server hosts.

1. In the left navigation pane of Sybase Control Center, click the Unwired Server cluster name.
2. In the right administration pane, click the **Relay Servers** tab.
3. Select one or more relay server configurations.
4. Click **Generate**.
5. Choose **Outbound enabler configuration XML file**, then click **Next**.
6. Click **Finish**.
7. Select an output target for the file.

See also

- *Configuring RSOE Start Options* on page 56

Configuring State Manager as a Service

Set up the State Manager process to run as a service on the Relay Server host.

This task uses the **dbsvc** utility on the Web server host, which is installed from the Relay Server archive file, supplied on the Sybase Unwired Platform Runtime installation media.

1. Open a command shell window, and set the current directory to the location of the **dbsvc** executable.
2. Enter the following at the prompt.

   - IIS host (Windows)

     ```
     dbsvc -as -s auto -t rshost -w SUPRelayServer "C:\Inetpub
     \wwwroot\ias_relay_server\Server\rshost.exe" -q -qc -f
     "C:\Inetpub\wwwroot\ias_relay_server\Server\rs.config" -
     o "C:\Sybase\logs\rs.log"
     ```

     Note: The log file path you specify with **-o** must exist, before you invoke **dbsvc**.

   - Apache host (Linux)

     ```
     dbsvc -y -a apache_user -t rshost -w SUPRelayServer -q -
     qc -f /apache_install/modules/rs.config -os 100K -ot /
     tmp/rs.log
     ```

   Substitute parameter values shown here to match your configuration.

This command configures the State Manager process (rshost) as a service.

3. To start the State Manager service:

   - From the Windows Services Control Panel, right-click **SQL Anywhere - SUPRelayServer** and select **Start**.
   - From a Linux command shell:
     a. Make sure the State Manager service runs under the same user credentials as the Apache service.
     b. Change the current directory to:
        - IIS host (Windows) `C:\Inetpubs\wwwroot\ias_relay_server\Server`
        - Apache host (Linux) `/`*`apache_install`*`/modules/`
     c. At the command prompt, enter:
        ```
        dbsvc -u SUPRelayServer
        ```
   - You can stop the State Manager service either from the Windows Services control panel, or by entering the following at a command shell prompt:
     ```
     dbsvc -x SUPRelayServer
     ```
   - You can uninstall the State Manager service by entering the following at a command shell prompt:
     ```
     dbsvc -d SUPRelayServer
     ```

Installing a Load Balancer

(Applies only to deployments with two or more Relay Servers.) You can use either a software or a hardware load balancer to get the best performance out of your Relay Servers.

You should be able to use any hardware or software load balancer with the Relay Servers you have installed to support your Unwired Platform cluster. This document describes how to use Apache 2.2, with proxy load balancing.

If you are using a hardware load balancer, see the product documentation for instructions on setting it up.

If you are using a software load balancer other than Apache 2.2, see the program documentation for instructions on setting it up.

Using Relay Server with a Third-Party Load Balancer

You can use Relay Server with hardware or software load balancers to create Relay Server farms. However, sessions must be persisted.

1. To balance loads for a Relay Server farm, use a load balancer in front of the farm you create.
2. Ensure that the load balancer is configured to use session persistence (also known as sticky sessions) for all application traffic (packets).

The load balancer must persist with the same Unwired Server and Relay Server connection properties throughout the life cycle of the communication session.

Configuring Apache 2.2 as a Load Balancer

To use Apache 2.2 and later as a software load balancer, edit the Apache configuration file to enable mod_proxy and mod_proxy_balancer and set up the load-balancing features.

Prerequisites

Review the relevant Apache reference documentation:

- `mod_proxy` – *http://httpd.apache.org/docs/2.2/mod/mod_proxy.html*
- `mod_proxy_balancer` – *http://httpd.apache.org/docs/2.2/mod/mod_proxy_balancer.html*

Task

1. Install Apache 2.2 or later on a server in your DMZ.
2. Secure the server.

   Do not enable proxying until your server is secure.
3. Enable `mod_proxy`, `mod_proxy_balancer`.

   Uncomment the following lines in the Apache Web Server configuration file (`httpd.conf`):

   ```
   # mod_proxy - core module for proxying:
   LoadModule proxy_module modules/mod_proxy.so
   # mod_proxy_balancer implements clustering and load balancing:
   LoadModule proxy_balancer_module modules/mod_proxy_balancer.so
   ```
4. On Linux, build Apache with these modules enabled.
5. Enable additional modules as needed.

   Uncomment the lines for any additional modules for which you need the functionality. See the Apache documentation at *http://httpd.apache.org/docs/2.2/mod/*.
6. On Windows, use the template below to set up load balancing between your Relay Servers.

   Add the lines below to the Apache Web Server configuration file (`httpd.conf`). Replace terms in italics with actual values in your environment:
   - *Apache_port* – Apache server port number.
   - *Apache_srvr_name* – Apache server name.
   - *host_id* – virtual host ID.
   - *host_port* – virtual host port number.
   - *RS_farm* – Relay Server farm ID.
   - *RS#_IP* – IP address or server name for Relay Server #.

- *RS#_node* – node name for Relay Server #.
- *RS#_port* – port number for Relay Server #.
- *webserver_doc_root* – doc root in file system used by Apache Web server.

```
<VirtualHost host_id:host_port>

    ServerName Apache_srvr_name:Apache_port
    DocumentRoot webserver_doc_root

    # Enable forward proxy
    ProxyRequests On
    ProxyVia On
    <Proxy *>
        Order deny,allow
        Allow from all
    </Proxy>

    # Enable reverse proxy
    ProxyPass / balancer://RS_farm/ stickysession=X-SUP-SESSID
    ProxyPassReverse / http://RS1_IP:RS1_port/
    ProxyPassReverse / http://RS2_IP:RS2_port
    <Proxy balancer://RS_farm>
        BalancerMember http://RS1_IP:RS1_port/ route=RS1_node
        BalancerMember http://RS2_IP:RS2_port/ route=RS2_node
        # Set counting algorithm to more evenly distribute work:
        ProxySet lbmethod=byrequests
    </Proxy>

    # Enable load balancer management
    <Location /balancer-manager>
        SetHandler balancer-manager
    </Location>

    <Directory "htdocs">
        AllowOverride AuthConfig
    </Directory>

</VirtualHost>
```

Extend the example above to any number of Relay Servers by adding them to the `ProxyPassReverse` and `BalancerMember` lists.

Note: The `stickysession` parameter is required to support client request routing, also referred to as back-end server affinity, so that the load balancer always sends a device's request to the same server.

7. On Linux, use the template below to set up load balancing between your Relay Servers.

   Add the lines below to the Apache Web Server configuration file (`httpd.conf`). Replace terms in italics with actual values in your environment:

   - *RS_farm* – Relay Server farm ID.
   - *RS#_IP* – IP address or server name for Relay Server #.

- *RS#_node* – node name for Relay Server #.
- *RS#_port* – port number for Relay Server #.
- *RS1#_srvr* – server name for Relay Server #.

```
# Enable forward proxy
ProxyRequests On
ProxyVia On
<Proxy *>
    Order deny,allow
    Allow from all
</Proxy>

<Proxy balancer://mycluster>
    BalancerMember http://RS1_IP:RS1_port/ route=RS1_node
loadfactor=5 route=RS1_srvr
    BalancerMember http://RS2_IP:RS2_port/ route=RS2_node
loadfactor=5 route=RS2_srvr
    # Set counting algorithm to more evenly distribute work:
    ProxySet lbmethod=byrequests
</Proxy>

# Enable reverse proxy
ProxyPass / balancer://RS_farm/ stickysession=X-SUP-SESSID
ProxyPassReverse / http://RS1_IP:RS1_port
ProxyPassReverse / http://RS2_IP:RS2_port

# Enable load balancer management
<Location /balancer-manager>
    SetHandler balancer-manager
    Order Deny,Allow
    Allow from all
</Location>
```

Configuring Apache as a Load Balancer for the EIS Back End

When you use Apache as a load balancer for the EIS back end, some of the configuration file settings are different from those for Apache as a load balancer on the front end.

1. If the load balancer connects to SAP Data Orchestration Engine – DOE to load balancer to Unwired Platform cluster to device – use the settings below.

   Add the lines below to the Apache Web Server configuration file (`httpd.conf`). Replace terms in italics with actual values in your environment:

   - *DOE_cluster* – DOE cluster ID
   - *US#_IP* – IP address for Unwired Server #
   - *US#_node* – node name for Unwired Server #
   - *US#_port* – port number for Unwired Server #

   ```
       ProxyPass / balancer://DOE_cluster/ stickysession=X-SUP-SESSID
       ProxyPassReverse / http://US1_srvr:US1_port/doe/publish
       ProxyPassReverse / http://US2_srvr:US2_port/doe/publish
       <Proxy balancer://DOE_cluster>
         BalancerMember http://US1_srvr:US1_port/doe/publish
   ```

```
route=US1_node
      BalancerMember http://US2_srvr:US2_port/doe/publish
route=US2_node
```

Extend the example above to any number of Unwired Servers by adding them to the `ProxyPassReverse` and `BalancerMember` lists.

2. If the load balancer connects to SAP MobileGateway – MobileGateway to load balancer to Unwired Platform cluster to device – use the settings below in place of the corresponding settings in *Configuring Apache 2.2 as a Load Balancer* on page 60.

   Add the lines below to the Apache Web Server configuration file (`httpd.conf`). Replace terms in italics with actual values in your environment:

   - *DOE_cluster* – DOE cluster ID.
   - *US#_IP* – IP address for Unwired Server #.
   - *US#_node* – node name for Unwired Server #.
   - *US#_port* – port number for Unwired Server #.

   Note: The only difference in the settings below, relative to the settings for DOE, is the omission of "/doe/publish" in the references to Unwired Server instances.

   ```
    ProxyPass / balancer://DOE_cluster/ stickysession=X-SUP-SESSID
    ProxyPassReverse / http://US1_srvr:US1_port
    ProxyPassReverse / http://US2_srvr:US2_port
    <Proxy balancer://DOE_cluster>
      BalancerMember http://US1_srvr:US1_port route=US1_node
      BalancerMember http://US2_srvr:US2_port route=US2_node
   ```

   Extend the example above to any number of Unwired Servers by adding them to the `ProxyPassReverse` and `BalancerMember` lists.

Tips for Tuning Your Relay Server Configuration on IIS

Increase performance of Relay Servers hosted by IIS Web server.

Tuning your Relay Server configuration is a complex, iterative process that is beyond the scope of this document to cover in detail. This topic provides some basic tips to get you started on IIS. For instructions on implementing these tips, see the Microsoft documentation for your version of IIS.

1. Use a separate application pool for ias_relay_server\client and ias_relay_server\server.
2. For the ias_relay_server\client application pool:
   a) Disable the request queue limit.
   b) Increase the Web garden size to 4 times the number of CPU cores.
3. For the ias_relay_server\server application pool, set the Web garden size to 1.
4. Use a 64-bit Windows OS to get past the 32-bit limits nonpaged pool memory and virtual address space.

5. Monitor network performance and upgrade the network or switches if they are identified as bottlenecks.
6. Add Relay Servers to the farm.

Next

For an overview of performance tuning for Relay Server clusters, see *Performance Tuning Considerations on IIS* on page 64.

For a comprehensive guide to IIS tuning, refer to the *Internet Information Services (IIS) 7.0 Resource Kit*, written by Mike Volodarsky, Olga Londer, Brett Hill, Bernard Cheah, Steve Schofield, Carlos Aguilar Mares, and Kurt Meyer with the Microsoft IIS Team.

Performance Tuning Considerations on IIS

Many characteristics of the network environment in which Unwired Platform and Relay Servers are installed can reduce performance. Understanding what these are and which are most likely to cause problems provides some guidance in how to approach performance tuning.

Traffic Factors Affecting Performance

All of the following traffic factors can affect Relay Server cluster performance:

- Persistency
- Concurrency
- Timeout
- HTTP request/response size
- Back-end farm size
- Back-end server compute time
- Relationship between transfer rates of client-Relay Server network and outbound enabler-Relay Server network

Iterative Tuning

The key objective in performance tuning is to identify the bottlenecks, or limiting points, in the overall system so you can increase capacity where needed.

In practice, you must iteratively test with a targeted set of loads for your business and factor in traffic patterns at different times of day, especially at peak levels. Identify the bottlenecks in the overall system and then tune to relieve one or more identified bottlenecks. This process shifts the bottleneck from one component to another in the overall system, while gaining overall performance on each tuning iteration.

Where to Start

If the network surrounding the Relay Servers is not saturated, your first iteration identifies the Relay Servers as the bottleneck. Determine whether the existing Relay Servers can be tuned to perform more efficiently before considering adding Relay Servers to the farm. Relay Servers might be limited in speed by the resources below.

Potential Speed Limiting Resource	Likelihood
Network I/O between Relay Servers and outbound enablers	Likely
Network I/O between Relay Servers and clients	Likely
Application pool process (IIS) and thread availability	Unlikely
CPU (including overhead on context switching and interrupts)	Very unlikely

Relay Servers can be limited in data volume by these resources.

Potential Data Volume Limiting Resource	Likelihood
Application pool process (IIS) and thread availability	Likely
Pre-allocated shared memory of a fixed size	Likely under heavy load
Virtual memory	Unlikely
Nonpaged pool memory consumed by HTTPS system driver and kernel	Unlikely

You can monitor all these resources via Windows performance monitor except shared memory consumption; you can view this in a shared memory report in the Relay Server log whenever you archive the log. Tuning these elements, except shared memory size, falls under general IIS tuning practices. Separating `rs_client.dll` and `rs_server.dll` into different application pools enables resource partitioning and makes fine-tuning possible.

Relay Server Pass-Through Mode for HTTP Clients

HTTP clients can connect through a Relay Server to Unwired Server to use the REST services.

Common Requirements of Reverse Proxies

Reverse proxies used with Unwired Platform must comply with specific requirements for content encoding, HTTP headers, timeouts, and the URL passed to Unwired Platform.

A reverse proxy used with Unwired Platform must be a straight pass-though proxy server. Ensure that any reverse proxy used:

1. Does not change the content encoding of the requests or responses. Chunked transfer encoding is the required data transfer mechanism. Content-length encoding is not supported.
2. Does not remove any HTTP headers.
3. Sets a timeout period, if used, that is greater than the timeout used by the clients.

4. **Passes the resulting URL to Unwired Platform Runtime in the form, `http://`*`Host_Name`*`:`*`Port_No`*.**

Using a Reverse Proxy in Front of Relay Server

Configure a dedicated port for the Relay Server port, configure separate ports and contexts for each Relay Server farm.

This task implements the configuration policies using an Object API application as the example. The configuration details for Hybrid apps, Odata SDK, DOE applications, and REST applications are similar.

1. **Configure one port to serve each Relay Server port.**

   If you map an `/smp/relayserver` context of `http://reverseProxy:8080` to `http://relayServer:80`, the `/smp/relayserver` context must be added as a prefix of the URL suffix of the Relay Server.

   For example, set `/smp/relayserver/ias_relay_server/client/rs_client.dll` as `ConnectionProperties.UrlSuffix`, and set `/smp/relayserver/ias_relay_server/client/rs_client.dll/RBSFarm` as the `ConnectionProfile.StreamParams.Url_Suffix` for synchronization. The `FarmId` is set separately for `ConnectionProperties`.

2. **Configure two ports, with each port serving one Relay Server farm.**

   For example, if you map the root context of `http://reverseProxy:5001` to `http://relayserver:80/ias_relay_server/client/rs_client.dll/MBSFarm`, and map the root context of `http://reverseProxy:2480` to `http://relayserver:80/ias_relay_server/client/rs_client.dll/RBSFarm`, the Object API application then can set connection properties to connect directly to Unwired Server.

3. **Configure two contexts, with each context serving one Relay Server farm.**

   For example, if you map the `/smp/message` context of `http://reverseProxy:8080` to `http://relayserver:80/ias_relay_server/client/rs_client.dll/MBSFarm`, and map the `/smp/mobilink` context of `http://reverseProxy:8080` to `http://relayserver:80/ias_relay_server/client/rs_client.dll/RBSFarm`, the Object API application needs to set the URL suffix (`/smp/message` for registering the application and `/smp/mobilink` for synchronization). This is just like connecting to Sybase Unwired Platform through a Relay Server that is not installed at the default location. The difference is that there no `FarmId` for a reverse proxy.

Using a Reverse Proxy with Mutual SSL Authentication

Configure the reverse proxy to connect to Unwired Server using mutual SSL authentication, then set up specific certificate requirements.

If applications need to connect to Sybase Unwired Platform using mutual SSL authentication:

1. Configure the reverse proxy to connect the mutual SSL port of Unwired Server.
2. Configure the reverse proxy to trust the Unwired Server certificate.
3. Configure the reverse proxy to use an impersonator client certificate to connect Unwired Platform. The client certificate must be mapped to the "SUP Impersonator" role for all security configurations.
4. Configure the reverse proxy to require a client certificate.
5. Configure the reverse proxy with all trusted CA certificates of Unwired Platform, in order to accept all client certificates which can be accepted by Unwired Platform.
6. Configure the reverse proxy to forward the client certificate as a `SSL_CLIENT_CERT` HTTP header to the Unwired Server, in order for the server to retrieve and authenticate it.

Below is a sample configuration of an Apache reverse proxy. It maps the root context of port 8082 to https://sup-serve:8002 (the default mutual SSL port).

```
Listen 8082
<VirtualHost *:8082>
ServerName proxy-server
  # activate HTTPS on the reverse proxy
    SSLEngine on
    SSLCertificateFile "C:/Apache2.2/conf/proxy-server.crt"
    SSLCertificateKeyFile "C:/Apache2.2/conf/proxy-server.key"
    SSLCertificateChainFile "C:/Apache2.2/conf/proxy-server-ca.crt"
  # activate the client certificate authentication
    SSLCACertificateFile "C:/Apache2.2/conf/trusted-client-ca.crt"
    SSLVerifyClient require
    SSLVerifyDepth 10
    SSLProxyEngine On
    SSLProxyCACertificateFile C:/Apache2.2/conf/sup-server-ca.crt
    SSLProxyMachineCertificateFile C:/Apache2.2/conf/proxy-
client.pem
  # initialize the special headers to a blank value to avoid http
header forgeries
    RequestHeader set SSL_CLIENT_CERT ""
    <Location />
        4.add SSL_CLIENT_CERT header to forward real client
certificate
        RequestHeader set SSL_CLIENT_CERT "%{SSL_CLIENT_CERT}s"
        ProxyPass https://sup-server:8002/
        ProxyPassReverse https://sup-server:8002/
    </Location>
</VirtualHost>
```

Using Apache Reverse Proxy for HTTP Clients

For organizations with HTTP clients designed to consume Unwired Server services via scale-out nodes, you can optionally implement an Apache Reverse Proxy instead of a Relay Server in your production environment.

For an example of how to implement an Apache Reverse Proxy, see:

1. *Installing Apache Reverse Proxy*

   Download and install the Apache Reverse Proxy.
2. *Configuring the Reverse Proxy with httpd.conf*

   Edit the httpd.conf file to load modules required prepare the Reverse Proxy for Unwired Platform use.
3. *Mapping Proxy Ports to SMP Ports*

   For reverse proxy, you must map proxy ports to Sybase Unwired Platform ports.

Installing Apache Reverse Proxy

Download and install the Apache Reverse Proxy.

1. Download Apache 2.2 from a reliable source.
2. Install the proxy according to package instructions.

Configuring the Reverse Proxy with httpd.conf

Edit the `httpd.conf` file to load modules required prepare the Reverse Proxy for Unwired Platform use.

For information about running a reverse proxy in Apache, see *http://www.apachetutor.org/admin/reverseproxies*. For information about SSL and proxy modules, see *http://httpd.apache.org/docs/2.2/mod/mod_ssl.html* and *http://httpd.apache.org/docs/2.2/mod/mod_proxy.html*.

1. In a text editor, open `Apache2.2\conf\httpd.conf`.
2. Uncomment these lines to load headers, and required SSL and proxy modules.

   ```
   LoadModule headers_module modules/mod_headers.so
   LoadModule ssl_module modules/mod_ssl.so
   LoadModule proxy_module modules/mod_proxy.so
   LoadModule proxy_connect_module modules/mod_proxy_connect.so
   LoadModule proxy_http_module modules/mod_proxy_http.so
   ```

   The three `proxy_*` modules are required by three proxy modes: HTTP, 1-way HTTPS, and 2-way HTTPS. The `ssl_module` is required by both HTTPS proxy modes. The `headers_module` is required by 2-way HTTPS proxy mode.
3. Add these lines to enable port 8080 as an HTTP proxy.

   ```
    ##############################
   Listen 8080
         <VirtualHost *:8080>
           ServerName proxy-server
                 ErrorLog "C:/Apache2.2/logs/error.log"
                 TransferLog "C:/Apache2.2/logs/access.log"
                <Location/>
                 ProxyPass http://sup-server:8000/
                 ProxyPassReverse http://sup-server:8000/
                </Location>
   ```

```
      </VirtualHost>
##############################
```

4. Add these lines to enable port 8081 as a 1-way HTTPS proxy.

```
##############################
    Listen 8081
      <VirtualHost *:8081>
         ServerName proxy-server
                ErrorLog "C:/Apache2.2/logs/error.log"
                TransferLog  "C:/Apache2.2/logs/access.log"
              # activate HTTPS on the reverse proxy
                SSLEngine on
                SSLCertificateFile  "C:/Apache2.2/conf/proxy-
server.crt"
                SSLCertificateKeyFile  "C:/Apache2.2/conf/proxy-
server.key"
               SSLCertificateChainFile  "C:/Apache2.2/conf/proxy-
server-ca.crt"
                SSLProxyEngine On
                SSLProxyCACertificateFile C:/Apache2.2/conf/sup-
server-ca.crt
         <Location />
            ProxyPass https://sup-server:8001/
             ProxyPassReverse  https://sup-server:8001/
         </Location>
      </VirtualHost>
```

5. Add these lines to enable port 8082 as a 2-way HTTPS proxy.

```
##############################
    Listen 8082
      <VirtualHost *:8082>
         ServerName proxy-server
                ErrorLog "C:/Apache2.2/logs/error.log"
                TransferLog  "C:/Apache2.2/logs/access.log"
              # activate HTTPS on the reverse proxy
                SSLEngine on
                SSLCertificateFile "C:/Apache2.2/conf/proxy-
server.crt"
                SSLCertificateKeyFile "C:/Apache2.2/conf/proxy-
server.key"
                SSLCertificateChainFile "C:/Apache2.2/conf/proxy-
server-ca.crt"         # activate the client certificate
authentication
                SSLCACertificateFile "C:/Apache2.2/conf/trusted-
client-ca.crt"
                SSLVerifyClient require
                SSLVerifyDepth  10
                SSLProxyEngine On
                SSLProxyCACertificateFile C:/Apache2.2/conf/sup-
server-ca.crt
                SSLProxyMachineCertificateFile C:/Apache2.2/conf/
proxy-client.pem
           # initialize the special headers to a blank  value to
avoid http header forgeries
               RequestHeader set  SSL_CLIENT_CERT ""
              <Location />
```

```
            # add  SSL_CLIENT_CERT header to forward real client 
certificate
               RequestHeader set SSL_CLIENT_CERT "%
{SSL_CLIENT_CERT}s"
               ProxyPass  https://sup-server:8002/
               ProxyPassReverse  https://sup-server:8002/
              </Location>
         </VirtualHost>
##############################
```

6. Save the file.
7. Validate the configuration by opening a browser and testing these URLs.
    - https://proxy-server:8080/debug/app1
    - https://proxy-server:8081/debug/app1
    - https://proxy-server:8082/debug/app1

See also

- *Mapping Proxy Ports to SMP Ports* on page 70

Decrypting Certificates for HTTPS Connections

The Apache 2.2 Windows version does not support encrypted certificate key files. If the key file is encrypted, you must first decrypt it.

1. To decrypt an encrypted file, from a command prompt, run:
   `openssl rsa -in encrypted.key -out decrypted.key`
2. Use the decrypted key in the `httpd.conf` file.

Mapping Proxy Ports to SMP Ports

For reverse proxy, you must map proxy ports to Sybase Unwired Platform ports.

For reverse proxy information, see:

- *Sybase Control Center for Sybase Unwired Platform*, see:
    - *Configuring Web Container Properties*
    - *Configuring a Replication Listener*
    - *Configuring Messaging Properties*
    - *Setting Relay Server General Properties*
- *Security*, see *Port Number Reference*

See also

- *Configuring the Reverse Proxy with httpd.conf* on page 68

The Agentry Server in SAP Mobile Platform Clustered Environments

The Agentry Server runs in the standard SAP Mobile Platform clustered environment. The following items are important to note concerning the configuration of the Agentry Server and the network environment when running in the SAP Mobile Platform clustered environment:

- The network environment must include a load balancer that sits logically between the Agentry Clients and the Agentry Servers within the SAP Mobile Platform nodes within the cluster. The configuration of this load balancer is separate and different from the load balancer for other archetypes within SAP Mobile Platform in that Agentry client-server communications do are not routed through the relay server.
- As a part of the communications security between the Agentry Clients and Agentry Server there is an encryption key which includes a public and private key pairing. For each Agentry Server this key pairing is unique by default. The result of this behavior is that an Agentry Client is tied to a given Agentry Server after its initial transmit. Attempting to connect with another Agentry Server with a different encryption key will result in an error and will not complete successfully. For this reason, the utility `AgentryKeyUtility` is provided with each Agentry Server installation and is used to export the encryption key from on Agentry Server instance and to then import this key into all other Agentry Server instances within a cluster.

For information on using the `AgentryKeyUtility` see the procedure *SAP Mobile Platform Clustering: Configuring Agentry Applications*. For additional guidance on configuring a load balancer, read on.

Load Balancer and SAP Mobile Platform Cluster with Agentry Applications

The load balancer configuration for Agentry applications operating within the SAP Mobile Platform cluster is a typical configuration. The instructions provided for other archetypes within the SAP Mobile Platform are not applicable to Agentry applications.

The configuration of the load balancer should meet the following criteria:

- The load balancer should sit logically within the network between the Agentry Clients and the SAP Mobile Platform cluster.
- The Agentry Clients should all connect to the IP address and port of the load balancer.
- The load balancer should redirect traffic from Agentry Clients to the Agentry Servers running within the SAP Mobile Platform cluster directly. This traffic must not be routed through the relay server provided with SAP Mobile Platform, which is used for other archetypes within the platform.

There are no additional requirements beyond those of a standard load balancer implementation. The client-server communications for Agentry applications use standard TCP/IP communications as a part of the ANGEL connect type for transmit configurations.

See also

- *Completing Installation Worksheets* on page 27
- *Performing the Installation* on page 27
- *Completing New and Upgrade Installations* on page 28
- *Adding Relay Servers or Reverse Proxies* on page 37

SAP Mobile Platform Clustering: Configuring Agentry Applications

Prerequisites

The following items must be addressed prior to performing this procedure:

- It is assumed that each node in the SAP Mobile Platform cluster has been installed and configured.
- Review information on the Agentry Server utility: `AgentryKeyUtility`.

Task

This procedure provides the steps specific to Agentry applications to configure such applications, specifically the Agentry Server and network environment, to run in the SAP Mobile Platform clustered environment.

This procedure describes the steps necessary to migrate the Agentry Server's encryption keys for client-server communications.

1. Stop the Agentry Server application for all nodes in the cluster using the SAP Control Center.
2. In the primary node installation location of the SAP Mobile Platform, navigate to the directory: `C:\SAP\MobilePlatform\Servers\AgentryServer`
3. Execute the command `agentryKeyUtility -export=`*`fileName`* where *`fileName`* is the name of the key file to be created.
4. Copy the file created to the directory `C:\SAP\MobilePlatform\Servers\AgentryServer` of the next node in the cluster.
5. Execute the command `agentryKeyUtility -import=`*`fileName`* where *`fileName`* is the name of the key file created in the earlier step in this procedure.
6. Start the Agentry Server application for all nodes in the cluster using the SAP Control Center.
7. Deploy the application to the nodes of the cluster per documented procedures.

The encryption key has been migrated to all nodes in the cluster, allowing the Agentry Clients to connect with any of the Agentry Servers.

Next

Deploy the mobile application to the nodes in the cluster per the documented procedures. Configure the network load balancer to direct client-server communications appropriately to the Agentry Servers within the cluster. Test the application thoroughly according to standard testing procedures.

System Deployment Reference

Reference information that supports Unwired Platform system deployment tasks.

Port Number Reference

Components of Sybase Unwired Platform rely on communication ports for inter-process coordination, data transfer, and administrative access.

Unwired Server Ports

Unwired Server ports, default assignments, and protocols.

Type	Default	Protocol
Administration, Unwired Server	2000 2001 (secure)	IIOP IIOPS
HTTP listeners (used for application connections, REST/OData APIs, and data change notifications)	5001 8000 8001 (secure)	HTTP HTTP HTTPS
Messaging service administration	5100	HTTP
Replication	2480 2481 (secure)	HTTP HTTPS

See also

- *Unwired Platform Port Accommodation* on page 7

Data Tier Ports

Data tier server ports, default assignments, and protocols.

Type	Default	Protocol
Cache database (CDB) server, client access	5200	Command sequence on connection to Unwired Server replication engine Tabular Data Stream™ (TDS) on JDBC connection TCP and UDP, when using Windows Filtering Platform (WFP)
Cluster database server, client access	5300	TDS
Monitor DB, client access	5400	TDS
domainlog DB, client access	5400	TDS

See also

- *Unwired Platform Port Accommodation* on page 7

Sybase Control Center Ports

Ports used by Sybase Control Center services, default assignments, and protocols.

Type	Default	Protocol
RMI service	9999	TCP/IP
Messaging service	2100	TCP/IP
SCC repository database server	3638	TDS
Web container	8282 8283	HTTP HTTPS

See also

- *Unwired Platform Port Accommodation* on page 7

Sybase Control Center Port Assignments

Port assignments for Sybase Control Center services are defined in XML configuration files.

Sybase Control Center service configuration files are named `service-config.xml`, and located in subdirectories under the *`SCC_HOME`*`\SCC-`*`X_X`*`\services\` directory.

SCC Service	Configuration File Location
Messaging service	`...\services\Messaging\`
RMI service	`...\services\RMI\`
SCC repository database server	`...\services\SccSADataserver\`
Web container	`...\services\EmbeddedWebContainer\`

To change the port assigned to an Sybase Control Center service, edit the `service-config.xml` file for that service.

Relay Server Ports

By default, Relay Server uses standard, IANA-assigned ports for HTTP (80) and HTTPS (443).

See also

- *Unwired Platform Port Accommodation* on page 7

Reserved Ports

Ports reserved for internal use by Unwired Platform components.

Type	Number	Protocol
Reserved	4343	TDS
Reserved	5011	HTTP
Reserved	6001	HTTP for SAP Introscope Agent
Reserved	8002	HTTPS

Do not use these reserved ports.

See also

- *Unwired Platform Port Accommodation* on page 7

Other Ports

Significant ports that are not directly associated with an Unwired Platform server component.

SySAM License Server

If you deploy Unwired Platform with the served license model, all Unwired Platform hosts must have network access to the license server port, on the SySAM license server host.

Type	Default	Protocol
SySAM license server	27000	

Sample Database Server

Both Personal Development Server and Enterprise Development Server Editions include a sample database, which is installed on the Unwired Server host, for tutorials and simple testing.

Type	Default	Protocol
Sample database	5500	TDS

The Enterprise Server Edition includes a sample database, but it is not enabled. To enable the sample database installed with Enterprise Server Edition, see *Create or Remove the Windows Service for sampledb Server (sampledb) Utility* in *System Administration*.

See also

- *Unwired Platform Port Accommodation* on page 7

Installation Directories

To ensure a successful installation, review the Sybase Unwired Platform server component installation directories.

- The following tables show the high-level directories created in a single-node installation (all Unwired Platform server components installed on a single host).
- In a multi-node or cluster installation, some of these directories are present only on a particular type of host.

By default, Unwired Platform server components are installed in the `C:\Sybase\UnwiredPlatform` directory. In this guide, *`SUP_HOME`* represents the Unwired Platform installation directory, down to the `UnwiredPlatform` folder.

Table 1. Unwired Platform Installation Subdirectories

Directory	Description
`_jvm`	JVM used by the uninstaller.
`sup`*`XX`*`ebflogs`	Log files created each time `installebf.bat` is run. Appears only in EBF installations upgraded from an earlier version of Unwired Platform.
`InstallLogs`	Log files created each time the Unwired Platform Runtime installer is used. Use these logs to troubleshoot installer issues.
`IntroscopeAgent`	Introscope Agent for 64-bit Installations.
`JDK`*`x.x.x_x`*	JDK required by Unwired Platform components.
`sapjco`	SAP Java Connector files.
`scc_cert`	Certificate files for Sybase Control Center.
`Servers`	Unwired Platform server components.
`Servers\MessagingServer`	SAP messaging server.
`Servers\SQLAnywhere`*`xx`*	Database server for cache, cluster, and logging databases. Default database file location is the `data\` subdirectory.
`Servers\UnwiredServer`	Unwired Server components.
`Servers\UnwiredServer\doe-c_clu`	Sybase SAP® Data Orchestration Engine Connector (DOE-C) Command Line Utility components. `CLU.bat` in `bin` directory starts the DOE-C console.
`Servers\UnwiredServer\doecSvlet`	Sybase SAP® Data Orchestration Engine Connector (DOE-C) runtime components.
`Servers\UnwiredServer\licenses`	SySAM license files. When an unserved license is updated, copy the new files here.
`sup`*`XX`*`upgrade`	Appears only in installations upgraded from an earlier version of Unwired Platform.

Directory	Description
`ThirdParty`	License terms of third-party components included in Sybase Unwired Platform.
`Uninstallers`	Uninstallers for Unwired Platform Runtime components.
	Unwired Platform Runtime uninstaller.
`Util`	Utilities used by the Unwired Platform Runtime installer.

By default, Sybase Control Center components are installed in the directory.

Note: If you have other Sybase products installed on the same host as Unwired Server, you may have more than one version of Sybase Control Center.

Table 2. Sybase Control Center Installation Subdirectories

Directory	Description
`backup`	Backup files.
`bin`	Scripts to start or stop Sybase Control Center management framework components.
`common`	Files shared by Sybase Control Center components.
`conf`	Configuration files, including security providers for administration logins.
`ldap`	LDAP-related files.
`log`	Log files used by Sybase Control Center and its console plug-ins to capture only management framework events. No Unwired Platform data is captured here, except administration logins.
`plugins`	Managed resource plug-ins.
`rtlib`	Runtime library files.
`sccRepoPwdChange`	Sybase Control Center repository password update files.
`server`	Class and library files used by the management framework server.

Directory	Description
`services`	Class and library files for Sybase Control Center services.
`shared`	Shared class and library files.
`templates`	Sybase Control Center service or plug-in template files.

Service Reference

Services are installed on each Unwired Platform server host to support managing and coordinating component processes.

Unwired Server Services

Services installed on an Unwired Server host.

Note: Some services may not be installed on an Unwired Server host, depending on the Unwired Platform product option, the deployment scenario and system design, and the licensed product edition.

Service	Description
Sybase Unwired Server	Top-level Unwired Server process. Coordinates other processes that handle interactions with EIS services, supports messaging and synchronization service to mobile clients, and provides Unwired Platform system management facilities.
Sybase Control Center *X.X*	Includes processes for managing, monitoring, and controlling distributed Unwired Platform server resources, and a Web app server for remote SCC console access.
Sybase Unwired SampleDB (optional)	Database server for sample database, enabled during installation only with Evaluation license, and with Personal Development Server and Enterprise Development Server licensed product editions. To enable with Enterprise Server Edition after installation, see *Create or Remove the Windows Service for sampledb Server (sampledb) Utility* in *System Administration*.

Data Tier Services

Services installed on a data tier host.

Note: Some services may not be installed on a data tier host, depending on the Unwired Platform product option, the deployment scenario and system design, and the licensed product edition.

Service	Description
Sybase Unwired CacheDB	Database server that manages the cache database, used primarily to support mobile clients that depend on occasional synchronization of local data stores.
Sybase Unwired ClusterDB	Database server that manages the cluster database, which supports Unwired Server runtime management and operational processes.
Sybase Unwired LogDataDB	Database server that manages the Unwired Server logging databases (system logging and domain logging).

When the data tier is installed in a single-node system:

- The Sybase Unwired ClusterDB and Sybase Unwired LogDataDB services are not installed.
- The Sybase Unwired CacheDB service manages the cache database, cluster database, and logging databases.

Starting Required Services

Before beginning development, you must start required Unwired Platform services.

Prerequisites

Ensure the required services are installed on the same host.

Task

By starting required services, you start the servers and dependent services. For a complete list of Unwired Platform services, see *System Administration > System Reference > Unwired Platform Windows Services*.

1. Click the **Start Unwired Platform Services** desktop shortcut to start Unwired Server and the dependent services.
2. Use the Services Control Panel to verify that the Windows service named Sybase Control Center X.X is started. If it has not, start it by selecting the service and clicking **Start**.

Starting and Stopping Unwired Server

You can start and stop Unwired Server in different ways, depending on the use context.

Review this table to understand which method you should use.

Method	Use When	Services Started or Stopped
Sybase Control Center Unwired Server list	Stopping or starting remote Unwired Server nodes	Unwired Server service only
Desktop shortcut	Stopping or starting Unwired Server locally	All runtime services installed on that host
Windows Services panel	Stopping or starting Unwired Server locally	Any combination of individual services that require stopping

Note: You cannot start a Scale-out node from Sybase Control Center. If you stop a Scale-out node, you must start it manually.

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