COMPAQ

Software Product Description

PRODUCT NAME: BASEstar Open Server Version 3.2 **SPD 47.87.10**

DESCRIPTION

BASEstar Open is an industrial automation integration framework that facilitates the integration of manufacturing applications and plant equipment. Accelerated development of integrated manufacturing systems is assured through an architecture that also encourages consistency of application development.

BASEstar Open takes advantage of the client/server computing architecture. BASEstar Open Servers provide the robust, high-availability environment required by mission-critical applications. BASEstar Open Clients, on the other hand, provide access to all BASEstar Open services and BASEstar Open-managed information from any network Node on which BASEstar Open Client is installed. Client and server communications within BASEstar Open are provided through TCP/IP network communications.

For a description of the BASEstar Open Client product, refer to SPD 62.54.xx

BASEstar Open software provides services that allow comprehensive support for manufacturing application integration, device connection, and control of plant equipment. The software operates in a distributed processing environment and its application integration features include:

- Collection, management, and distribution of plant data
- Automatic notification of significant (and critical) plant events
- Exchange of packets of data via peer-to-peer communication
- Facilities for allowing the synchronization and restarting of manufacturing applications

In addition, BASEstar Open has the capability of allowing applications distributed across different network Nodes to use globally-defined information (BASEstar Open objects).

Device integration software provides services to access and control plant floor equipment using both proprietary and standard MMS communication protocols. Specific communication services are provided through specific Device Access Software (DAS) modules. The DAS modules require separate licenses from BASEstar Open.

Features

Application Integration

- Data Management

BASEstar Open Data Services provide a standard mechanism for defining, organizing, and accessing data in a distributed manufacturing environment from a variety of sources including plant devices and area, plant, and work cell applications.

BASEstar Open defines discrete elements (Data_Points) to contain manufacturing information. Data_Point definitions can be of various types, ranging from scalar data elements to user-defined data structures. This provides the high flexibility of data definition and acquisition required to define the many different types of data typically present in industrial plants.

Since each Data_Point is referenced by name, applications become independent of their data sources and consequently do not require alteration as data sources change. In addition, simple Data_Points can have a

predefined value specified at startup time. The value of a Data_Point may also be derived from the value of another Data_Point. The derived value can be obtained directly or modified by an arithmetic/logical expression. Data Services allow applications to define and manage Data_Points.

You can associate each Data_Point with one or more Triggers. A Trigger defines a relationship between a Data_Point, a Filter, and an Event. Each time the value of a triggered Data_Point changes, associated Filter expressions are evaluated. Whenever the Boolean result of an evaluated Filter expression is TRUE, BASEstar Open declares the associated Event.

Likewise, the Timer object allows you to apply a time-based condition to the execution of an action. You can define the time condition as an absolute date, a time interval, or a combination of the two. When the Timer expires, BASEstar Open sends a message to the associated objects. You can associate Timers with Trigger objects.

It is possible to store one or more versions of a Data_Point value. In addition to the value, each Data_Point version includes the time when the Data_Point value changed and its status at that time.

BASEstar Open generates a new version each time the value of a Data_Point changes. You can therefore request the current version, containing the current value, or alternatively, the value associated with any cached version.

- Event Services

BASEstar Open Event Services allow you to subscribe to one or more Events. Events are occurrences that are of interest to an application program—like threshold exceeding, alarms, job completion, and so on. You can define the occurrence of such Events and specify the context information that you wish to pass. This context information can also include data and their types.

On declaration of an Event, Event Services create and deliver the notifications that the subscribers receive.

- Packet Services

BASEstar Open Packet Services allow you to exchange Packets of information directly with other users. Two users can establish direct communication through a Port; one user connects to send a Packet, and the other user connects to receive it.

A Packet contains a description of information to be exchanged. Each Packet input and output parameter is described by a datatype.

BASEstar Open delivers a Packet to a Port in a protocol-independent manner and also independent of the location of the users and Ports involved.

- Application Management Services (AMS)

BASEstar Open Application Management Services provide functions for managing and coordinating manufacturing applications. These applications may be standalone or distributed across the Nodes of a network.

Application Management Services allow users to organize application activities into hierarchical structures that support the execution startup and shutdown of synchronized activities, based on user-defined policies.

It is possible to execute, suspend, resumed, and terminate an application Activity. BASEstar Open monitors the status of all Activities. If an Activity (or Node) fails, you can choose from several recovery policies. For instance, in case of Node failure, you can restart an application on an alternative Node.

- Application Development Support

To assist in developing applications, especially when debugging or troubleshooting, BASEstar Open provides a Source Trace Tool. BASEstar Open uses this tool internally. It is also available to users for monitoring the execution flow of an application.

You can enable or disable trace facilities dynamically by specifying different granularity levels; it is not necessray to stop and restart the tracing process. The output of the trace tool can be routed to several kinds of output devices—memory, files, terminals, and so on.

Device Integration

- Device Management

BASEstar Open software enables applications to interact with plant devices without knowledge of physical device characteristics such as location, protocol, or device specific data formats. Physical devices are modeled in compliance with the MMS standard — Message Manufacturing Specification ISO 9506. Devices are accessed through specific Device Access software (DAS) which provides operations such as reading and writing of simple and structured data via specific device protocols.

- Device Access Software (DAS)

Different manufacturing devices use different services and communication protocols to connect to a computer system. These services and communication protocols are typically control vendor-proprietary.

BASEstar Open DAS software provides proprietary communication specifications to access device controllers that are available on the market from multiple control vendors.

Device Access Software for many leading industrial control devices is available through Compaq.

- Data Collection

BASEstar Open software collects data from plant devices on request from the host Node (solicited), at predefined intervals (polling), or when generated by a device (unsolicited).

Polling is a means of collecting data by reading specified address registers in the memory of a programmable device at pre-defined intervals. To perform this task, the application defines a set of Data_Points (a Polling_Set) from which data is to be collected.

In addition, BASEstar Open can receive unsolicited data directly from plant equipment devices, thus eliminating the processing overhead associated with continuous polling.

- BASEstar Classic Device Connectivity integration

BASEstar Open for OpenVMS includes a subset of BASEstar Classic to enable the use of many of the DASes available through the BASEstar Classic DCM connectivity. For specific information about the BASEstar Classic DASes supported by specific versions of DCM and the OpenVMS operating system, consult the Compaq Professional Services organization.

Configuration Management and BASEstar Open Objects

System designers of manufacturing applications that use BASEstar Open model the plant by relating plant data, devices, significant occurrences, etc. to BASEstar Open objects. This modelling process is called configuration and can be performed in several different ways, using either the Graphic Configuration, the Command Language Interface (CLI), or via user application program calls to BASEstar Open Configuration Services.

- Named Objects

The BASEstar Open environment is a collection of BASEstar Open named objects representing plant devices and Data_Points—alarms, data status, production counts, and so on. Manufacturing applications can therefore use meaningful functional names to access these resources, rather than in a system-dependent manner which would require, for instance, information on physical locations.

BASEstar Open objects reside in Domains. Domains are hierarchically linked to form a BASEstar Open Realm. Several Realms can be active at the same time.

- Local and Remote Objects Access

BASEstar Open objects can be directly accessed within a Realm by using the object's full pathname. The full pathname includes the local name preceded by the relevant Domain names. Alternatively, the user can set the default Domain and access objects in that Domain using local names, and objects in lower Domains using partial pathnames.

Logging

BASEstar Open logs error and diagnostic information, as well as significant events. The log files are effectively the "black box" of BASEstar Open. They provide the primary source of support for troubleshooting activity if a problem occurs.

BASEstar Open Interfaces

BASEstar Open Server provides the following interfaces:

- Application Programming Interface (API)

The BASEstar Open Server API allows users to develop customized C language application programs which can make full use of the BASEstar Open services.

- Command Line Interface (CLI)

The BASEstar Open CLI is a Command Line Interface for configuring and managing BASEstar Open objects. BASEstar Open services are available via the CLI which is typically used for configuration and rapid prototyping.

- Graphic Configuration Utility (GCU)

BASEstar Open offers a PC-based Graphic Configuration with a Windows "look and feel". It allows users to:

  - Manage BASEstar Open objects using create, delete and modify commands
  - Load existing configurations from CLI scripts and snapshots
  - Save configurations in CLI scripts and snapshots
  - Browse through BASEstar Open configurations.

The Graphic Configuration is bundled with BASEstar Open Server kits on Windows NT systems. It is included with the BASEstar Open Client on Windows NT and Windows 95/98 systems.

BASEstar Open users on Tru64 UNIX or OpenVMS platforms can take advantage of the Graphic Configuration via the PC-based BASEstar Open Client and GCU product. The PC-based Graphic Configuration replaces the Motif-based GCU previously available with BASEstar Open Version 2.0.

- DDE Connectivity DDE (Dynamic Data Exchange) is a protocol that allows PC-based applications to exchange data. It ensures compatibility between the PC-based data representation (used on Windows NT and Windows 95/98 platforms) and the native BASEstar Open data representation. This capability augments significantly the scope of BASEstar Open, allowing you to integrate DDE-compliant software packages such as Microsoft Excel, InTouch from Wonderware, and DDE drivers.

Program Development

With the appropriate development license, users can develop BASEstar Open applications via the following:

- BASEstar Open API (see above)
- BASEstar Open CLI (see above)
- BASEstar Open's high level language, BASEstar CIMfast.

BASEstar CIMfast is an application enabler that provides the following benefits to BASEstar Open application developers:

- Fully portable applications
- Reduced development time
- Reduced application complexity
- Enhanced software maintainability
- Rapid prototyping capability.

BASEstar CIMfast allows even inexperienced BASEstar Open application developers to create BASEstar Open applications quickly.

BASEstar CIMfast provides a very high level event-driven language especially suited for describing highly asynchronous BASEstar Open interaction. This language, called the CIMfast Event Language (CEL), has the following features:

- Based on an Event/Action paradigm
- Can be integrated with existing BASEstar application code
- Can be customized by adding user-developed callback functions
- Supports the use of the Language-Sensitive Editor (DEC/LSE) for menu-driven program creation (OpenVMS only)
- Support for DECmessageQ

The BASEstar CIMfast Event Language allows the user to describe in very simple terms which BASEstar Open Events will trigger a reaction. Example Events include:

- Data changes representing the current state of the shop floor
- Receipt of a message from another BASEstar Open or DMQ application
- Expiry of a time interval.

For each Event, the user can specify a sequence of actions to be taken when this Event occurs. Example actions include:

- Activation or disactivation of a manufacturing device
- A read or write operation from a manufacturing device's memory
- Transmission of a message to another BASEstar Open or DMQ application
- A call to a user-written high level language function

The BASEstar CIMfast Event Language provides a wide range of Events and actions that support the typical interaction of an application with BASEstar Open.

Development and Run-time Versions

Users who wish to develop BASEstar Open applications require the BASEstar Open development version. This allows you to compile and link C language programs containing BASEstar Open API calls with the BASEstar Open libraries. Users who already have available a compiled and linked BASEstar Open application only need a run-time version of BASEstar Open.

BASEstar Open Functionality - Platform Differences

In general, all BASEstar Open functionality is available across all the supported platforms. However, there may be specific differences for a given release depending on the platform on which the server is running. At the time of writing, the differences are as follows:

- Source Trace Manager—not available with BASEstar Open Server on Windows NT
- Graphic Configuration—bundled with BASEstar Open Server on Windows NT only
- PODB support—not available with BASEstar Open Server on Windows NT

For a detailed list of differences, refer to your platform-specific release notes.

Documentation

BASEstar Open Server is supported by the following documentation:

- Run-time documentation kit:
  - — BASEstar Open Introduction provides an overview of the services and concepts within BASEstar Open.
  - — BASEstar Open Reference Guide provides the definition and specification of the object model within BASEstar Open.
  - — BASEstar Open Command Language Interface provides the specification of the command line interface to access BASEstar Open services.
  - — BASEstar Open Messages provides the definition and the description of BASEstar Open error messages and suggested solutions.
  - — Compaq OMNI API Guide to Using OMNI Directory Services provides the specification for the OMNI Directory Services.

- Development documentation kit:
  - — Run-time manuals
  - — BASEstar Open Application Programming Interface provides the specification of the callable interface to access BASEstar Open interfaces.
  - — BASEstar CIMfast Programmer's Reference Guide
  - — BASEstar CIMfast User's Guide
  - — BASEstar CIMfast Guide to DECmessageQ
  - — BASEstar CIMfast Guide to SQL Support
- An installation and management guide specific to each operating system, for installing BASEstar Open Server on the selected operating system. It provides instructions on how to install BASEstar Open and platform-specific user information.

BASEstar Open Server Release Notes describes new features provided with BASEstar Open Server on OpenVMS, Tru64 UNIX, and Windows NT platforms, and details any functional and documentation errors.

INSTALLATION

Before attempting to install the software, the customer must have all the pre-requisite hardware and software installed. Compaq recommends that a customer's first purchase of this software include Compaq Installation Services.

Connectivity to all other Nodes within the network is the responsibility of the customer.

SUPPORTED VERSIONS

This SPD covers the following versions of the BASEstar Open Server product:

- BASEstar Open Server for OpenVMS VAX V3.2
- BASEstar Open Server for OpenVMS Alpha V3.2
- BASEstar Open Server for Tru64 UNIX V3.2
- BASEstar Open Server for Windows NT V3.2

HARDWARE REQUIREMENTS

Processors Supported

BASEstar Open Server for OpenVMS VAX Version 3.2:

VAX processors supporting OpenVMS VAX V6.1 to V7.2

BASEstar Open Server for OpenVMS Alpha Version 3.2:

Alpha processors supporting OpenVMS Alpha V6.1 to V7.2

BASEstar Open Server for Tru64 UNIX Version 3.2:

Alpha processors supporting Tru64 UNIX V3.2C to V5.0

BASEstar Open Server for Windows NT Version 3.2:

Intel processors supporting Windows NT V4.0

DISK AND MEMORY SPACE REQUIREMENTS

BASEstar Open Server for OpenVMS VAX Version 3.2

Minimum recommended memory:

- 48 Mbytes

Disk space required:

- 30,000 blocks (for installation)
- 28,100 blocks (for subsequent use)

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BASEstar Open Server for OpenVMS Alpha Version 3.2

Minimum recommended memory:

- 96 Mbytes

Disk space required:

- 60,000 blocks (for installation)
- 50,000 blocks (for subsequent use)

BASEstar Open Server for Tru64 UNIX Version 3.2

Minimum recommended memory:

- 96 Mbytes

Disk space required:

- 90 Mbytes (for installation and subsequent use)

BASEstar Open Server for Windows NT Version 3.2

Minimum recommended memory:

- 32 Mbytes

Disk space required:

- Development:
  - — 28 Mbytes (for installation) and 26 Mbytes (for subsequent use)
- Run-time:
  - — 22 Mbytes (for installation) and 20 Mbytes (for subsequent use)

Actual memory requirements depend on application characteristics like the number and size of Data_Points, the number and frequency of Events, device access frequency, etc.

Disk space values do not include disk space required for using supported relational databases.

The above values refer to the disk space required on the system disk. The sizes are approximate; actual sizes will vary depending on the user's system environment and use of BASEstar Open.

SOFTWARE REQUIREMENTS

YEAR 2000 READY

This product is Year 2000 Ready. "Year 2000 Ready" products are defined by Compaq as products capable of accurately processing, providing, and/or receiving date data from, into and between the twentieth and the twenty-first centuries, and the years 1999 and 2000, including leap year calculations, when used in accordance with the associated product documentation and pro- vided that all hardware, firmware and software used in combination with such products properly exchange accurate date data with the products.

GROWTH CONSIDERATIONS

The minimum hardware/software requirements for any future version of this product may be different from the requirements for the current version.

DISTRIBUTION MEDIA

This product is available on CD-ROM for Tru64 UNIX, OpenVMS Alpha, OpenVMS VAX, and Windows NT platforms. It is also available on TK50 streaming tape for OpenVMS VAX platforms.

ORDERING INFORMATION

BASEstar Open Server for OpenVMS VAX Development Option:

Software Licenses: QL-0X7A9-**
Software Documentation: QA-0X9AA-GZ
Software Media: QA-0X7AA-**
Software Product Services: QT-0X7A*-** Software Product Services: QT-0X7A*-**

BASEstar Open Server for OpenVMS VAX Run-time Option:

Software Licenses: QL-0X6A9-**
Software Documentation: QA-0X8AA-GZ
Software Media: QA-0X6AA-**
Software Product Services: QT-0X6A*-**

BASEstar Open Server for OpenVMS Alpha Development Option:

Software Licenses: QL-0X9A9-**
Software Documentation: QA-0X9AA-GZ
Software Product Services: QT-0X9A*-**

BASEstar Open Server for OpenVMS Alpha Run-time Option:

Software Licenses: QL-0X8A9-**
Software Documentation: QA-0X8AA-GZ
Software Product Services: QT-0X8A*-**

BASEstar Open Server for Tru64 UNIX Consolidated Software Distribution:

Software Media: QA-5SRAA-H8

BASEstar Open Server for Tru64 UNIX Development Option:

Software Licenses: QL-0XBA9-**
Software Documentation: QA-0XBAA-GZ
Software Product Services: QT-0XBA*-**

BASEstar Open Server for Tru64 UNIX Run-time Option:

Software Licenses: QL-0XAA9-**
Software Documentation: QA-0XAAA-GZ
Software Product Services: QT-0XAA*-**

BASEstar Open Server for Windows NT Development:

Software Licenses: QM-2X2AA-AA
Software Documentation: QA-2X2AA-GZ
PC package (documentation, license):

QB-2X2AA-SA
Software Product Services: QT-2X2A*-**

BASEstar Open Server for Windows NT Run-time:

Software License (unlimited use): QM-2X0AA-AA
Software Documentation: QA-2X0AA-GZ
PC package (documentation, license):
QB-2X0AA-SA
Software Product Services: QT-2X0A*-**

The above information is valid at the time of release. Please contact your local Compaq office for the most up-to-date information.

SOFTWARE LICENSING

This software is furnished only under a license. For more information about Compaq licensing terms and policies, contact your local Compaq office. Users who intend to develop applications which make use of the BASEstar Open services require a BASEstar Open Server development license.

SOFTWARE PRODUCT SERVICES

A variety of service options are available from Compaq. For more information, contact your local Compaq office.

SOFTWARE WARRANTY

This software is provided by Compaq with a 90 day conformance warranty in accordance with the Compaq warranty terms applicable to the license purchase.

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