Software Product Description

PRODUCT NAME: **BASEstar Open Server**   **SPD 47.66.00**
                       for OpenVMS AXP, Version 2.0

DESCRIPTION

BASEstar Open software 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. While the server software library supplies all supported services, the client software library allows the application to access the same services. A client can also access the services from a different node connected on the network. Client and server communications within BASEstar Open are provided through TCP/IP network communications.

BASEstar Open software provides services that allow a 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) events in a plant

- Exchange of packets of data through a peer-to-peer communication

- Execution of synchronization for manufacturing applications

In addition, the software has the capability of allowing applications that are distributed across different nodes in the network to use globally defined objects.

Devices integration software provides services to access and control plant floor equipment based on proprietary and standards communication protocols. Specific communication services are provided through the Device Access Software (DAS) which is not covered by the BASEstar Open license.

BASEstar Open has the following interfaces:

- The Command Line Interface (CLI) is used by system managers and manufacturing engineers to configure and manage BASEstar objects.

- The Application Programming Interface (API) is used by software developers and provides callable services for application integration.

- The Graphic Configuration Utility is graphical tool for configuring object definitions.

Note: Callable device services are provided through the DEComni (OSI Manufacturing Network Interface) Application Programming Interface which is covered by the BASEstar Open Server license. This interface is modeled on the MMS (Manufacturing Message Specification) standard as specified in the ISO 9506 definition.

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 as well as area, plant, and work cell applications.

  BASEstar Open defines discrete data elements (datapoints) to manage manufacturing information. Datapoint definitions can be of various types, ranging from scalar data elements to user defined data structures. This maximizes the flexibility of data definition and acquisition.

  Because each datapoint is referenced by name, applications are independent of data sources and, consequently, do not require alteration when data sources change. In addition, simple datapoints can have a predefined value specified at startup time. Data services allow applications to define and manage datapoints.

  Each datapoint can be associated with one or more triggers. A trigger defines a relationship between a datapoint, a filter, and an event. Each time the value

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of a triggered data point changes, associated filter expressions are evaluated. Whenever the Boolean result of an evaluated filter expression is TRUE, the associated event is declared.

One or more versions of a datapoint value can be stored. A version is made up of, in addition to the value, the time when the datapoint value changed and its status at that time.

A new version is generated each time the value of a datapoint changes for any reason. A user can request the current version, and thus the current value, or alternatively the value associated with any cached version.

- Event Services

BASEstar Open event services allow users to subscribe to one or more events. Events are occurrences that are of interest to an application program—threshold exceeding, alarms firing, job completion, and so on. Users can also define the occurrence of such events and specify the context information that should be passed. This context information can also include typed data.

To be notified of the occurrence of a specific event, the application must issue a subscription to the event.

When an event is declared, event services create and deliver the notifications that can be received by subscribers. A single event declaration can generate many notifications on a one to many relationship. This depends on the number of active subscriptions.

- Packet Services

BASEstar Open Packet Services allow users to directly exchange packets of information. Two users can establish direct communication through a port to be used to send a packet, and from which a partner can be connected to receive it.

A packet contains a description of the information that must be exchanged. Each input and output parameter of a packet is described by means of a datatype.

BASEstar Open delivers a packet to a port in a protocol independent manner and regardless of the location of the involved users and ports.

- Application Services

BASEstar Open application services provide all the functions required to manage and coordinate manufacturing applications. These applications may be standalone or distributed across the nodes of a network.

Application services allow users to organize application activities into hierarchical structures that support the execution startup and shutdown of synchronized activities, and user-defined error recovery policies.

An application activity can be executed, suspended, resumed, and terminated. All activity states are monitored. If an activity (or node) fails, several recovery policies can be applied. For instance, in case of node failure, an application can be restarted on an alternative node.

- Application Development Support

To assist in developing applications, especially when debugging or troubleshooting, a source trace tool is provided. This tool is used internally by BASEstar Open and is also available to users for monitoring the execution flow of an application.

Trace facilities can be dynamically enabled or disabled by specifying different granularity levels; it is not required that the user stops and restarts 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. These, however, are accessed through specific software (DAS) which provides operations such as reading and writing of simple and structured data.

- 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 to collect data by reading specified address registers in the memory of a programmable device at pre-defined intervals. To do so, the application is required to define a set of datapoints (pollsets) from which data need to be collected.

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

- 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 control vendor proprietary.

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

Device Access Software for most leading industrial control devices is available through Digital.

Configuration Management

- Named Objects

  The BASEstar Open environment is a collection of named objects which represent plant devices and datapoints—alarms, data status, production counts, and so on. Manufacturing applications can access these resources according to a functional use 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

  In addition to error and diagnostic information, BASEstar Open allows the logging of significant events. For instance, the creation of an object definition.

- System Configuration and Tuning

  BASEstar Open software provides command procedures that can be used to tune object configurations. A system manager can use the suggested values as guidelines in setting parameter values to optimize the usage of system resources.

BASEstar Open Interfaces

- Application Programming Interface (API)

  The BASEstar Open API allows software programmers to create and integrate manufacturing applications using BASEstar Open services.

- Command Line Interface (CLI)

  The BASEstar Open CLI is a command interface for use by system managers, process engineers, and application programmers. Commands are provided for performing general operations such as BASEstar Open object configuration and management.

- Graphic Configuration Utility (GCU)

  The Graphic Configuration Utility is graphical tool, that is mainly intended to help application developers in configuring objects definition in the Permanent Object Database (PODB).

  By using this Configuration Utility, the application can create, modify, delete and rename BASEstar Open PODB objects. It can also display the graphical layout of the BASEstar Open configuration.

Documentation

BASEstar Open Server for OpenVMS AXP includes the following documentation:

- *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 Application Programming Interface* provides the specification of the callable interface to access BASEstar Open services.

- *BASEstar Open Command Language Interface* provides the specification of the command line interface to access BASEstar Open services.

- *BASEstar Open Configuration Utility User's Guide* provides information on how to configure BASEstar Open objects through the supported VMS DECwindows Motif[R]-based graphical user interface.

- *BASEstar Open Management Guide* provides the information to manage the BASEstar Open environment.

- *BASEstar Open Messages* provides the definition and the description of BASEstar Open error messages and suggested solutions.

- *BASEstar Open for OpenVMS AXP Installation Guide* provides instructions on how to install BASEstar Open Server for OpenVMS AXP.

- *Release Notes* describes the new features provided with BASEstar Open Server for OpenVMS AXP, and details any functional and documentation errors.

- Software Product Description—this document

INSTALLATION

Only experienced customers should attempt the installation. Digital recommends that all other customers purchase Digital's Installation Services.

Digital recommends that the first purchase of this software product should include Digital's Installation Services. These services support installation of the software product by an experienced Digital Software Specialist.

Note: Should a software specialist be required to modify the operating system parameters from a previous installation, a prevailing rate time and materials charge will apply.

Connectivity to all other nodes within the network is the responsibility of the customer. Delays caused by any failure to meet these responsibilities will be charged at the prevailing rate for time and materials.

HARDWARE REQUIREMENTS

Disk space required for installation:

- 30,000 blocks

Disk space required for use (permanent):

- 28,100 blocks

Note: This value does not include disk space required by using supported relational databases.

These values refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options.

OPTIONAL HARDWARE

- No optional hardware is required.

SOFTWARE REQUIREMENTS

The following software is part of the requirements for BASEstar Open Server for OpenVMS AXP:

- OpenVMS AXP Operating System V6.1

Layered Products:

- DEC TCP/IP Services for OpenVMS V3.1

- DEC RdB for OpenVMS AXP V6.0

DEC RdB is required only for use of the Permanent Objects Database (PODB).

For Systems Using Terminals:

- OpenVMS AXP Operating System V 6.1

For Workstations Running DECwindows Using Motif®:

- OpenVMS AXP Operating System V 6.1

- DECwindows Motif for OpenVMS AXP V 1.2

OPTIONAL SOFTWARE

- No optional software is required.

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

CD-ROM

This product is available on the Digital CD-ROM Software Library for OpenVMS AXP. This product is available as part of the OpenVMS AXP Consolidated Software distribution on CD-ROM.

SOFTWARE LICENSING

This software is furnished only under a license. For more information about Digital's licensing terms and policies, contact your local Digital office.

License Management Facility Support:

This layered product supports the OpenVMS License Management Facility. BASEstar Open Server is licensed in the following packages:

- BASEstar Open Server Development License which enables software developers to integrate manufacturing applications and devices.

- BASEstar Open Server Runtime License which allows applications and devices that are already integrated with BASEstar Open software to run in a BASEstar Open environment.

License units for this product are allocated for either "Concurrent Use" or "Unlimited System Use".

For more information on the License Management Facility, refer to the OpenVMS AXP Operating System Software Product Description (SPD 41.87.xx) or the OpenVMS AXP Operating System documentation.

SOFTWARE PRODUCT SERVICES

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

SOFTWARE WARRANTY

Warranty for this software product is provided by Digital with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

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

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ORDERING INFORMATION

Note: License units for BASEstar Open Server allow for development and runtime kits, and are allocated for either "Concurrent Use" or "Unlimited System Use". Each "Concurrent Use" license allows up to 250 BASEstar Open datapoints to be used.

BASEstar Open Server for OpenVMS AXP Development Option:

Software Licenses (unlimited use): QL-0X8A*-AA
Software Licenses (concurrent use): QL-0X8A*-AA
Software Documentation: QA-0X8AA-GZ
Software Product Services: QT-0X8A*-**

BASEstar Open Server for OpenVMS AXP Runtime Option:

Software Licenses (unlimited use): QL-0X9A*-AA
Software Licenses (concurrent use): QL-0X9A*-AA
Software Documentation: QA-0X9AA-GZ
Software Product Services: QT-0X9A*-**

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