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System 800xA Server node virtualization

Executive Summary

An initial step has been made to make virtualization technology based on VMware ESX available for users of System 800xA. A mid sized system using the most common parts of 800xA can be installed on two servers, having similar performance as a system built in the conventional way.

Products Concerned

System 800xA 5.0SP2

Description

Virtualization technologies are stepping into the automation system arena as a way to further minimize the footprint and cost of ownership of an installation. As the first DCS on the market System 800xA has been verified for server consolidation in a virtual environment. The technology chosen for this purpose is VMware ESX.

There are several advantages identified with this approach:

- Lower purchasing cost for the server hardware

- Less network switches, cabling, cabinets, etc

- Less space required

- Less power required, less cooling necessary

This is the first step make the technology available for users and applications where the technology fits. The following server functionality of an 800xA system is verified in a virtual environment:

- The 800xA Aspect server

- AC 800M Connectivity Server.

- Foundation Fieldbus Connectivity Server.

- Profibus Connectivity Server.

- Information Management Server.

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- Asset Optimization Server.

- The Domain Controller

Clients are not virtualized, and are installed in the conventional way.

Safety systems are not supported in virtual environment (under investigation).

The system size verified at this point:

- 20 000 Tags

- 36 controllers (3 virtual connectivity servers)

- 30 clients

- 3 engineering clients. In a plain engineering system 5..6 engineering clients can be used, possibly with some performance impact at bulk engineering jobs.

The virtualization technology can be applied to a regular 800xA system ordered as usual from the price book. Virtualization may require a separate license feature going forward, but initially this license will not be required and hence the capability is free of charge.

Virtualization is a new technology in the field of process automation. The verification that has been made in system type test environment has shown good results, and is performance wise even beyond a system built in the conventional way. Still, however, implementing virtualization in a production plant may reveal challenges we can not be fully prepared for.

To mitigate this, virtualization is made available using the "managed introduction" procedure, i.e. a TSA is required (Temporary Sales Authorization). A TSA is primarily required for production systems using virtualization. Engineering systems as well as internal test-and-learn and demo systems may be set up without having an approved TSA.

The reason for using the TSA procedure in this case is twofold;

- Enable product management to review the intended installation and verify it with known result from the testing done, and hence promote best practices and avoid mistakes where we have the knowledge.

- Enable a connection to the project such that feedback can be retrieved for further knowledge build-up, and further steps to be take in this direction.

A user instruction is available describing the VMware ESX virtualization technology, the 800xA server node virtualization concept based on VMware ESX, how to consolidate 800xA server nodes on VMware ESX servers, how to do the system planning, installation, and configuration using VMware ESX, and how to backup and restore a virtualized system. Additionally there is also a list of pieces and parts required.

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The user instruction is at this point the basis for setting up a plant control system based on virtualization technology. In further steps this documentation will be included in 800xA regular user documentation.

3BSE056141, 800xA Server Node Virtualization with VMware ESX.

See also reference to general presentation, 3BSE058225, for an overview.

Feedback from a number of initial projects is required in order to build up knowledge in R&D and the support chain. This means immediate projects where this technology is beneficial are appreciated. Such projects should have the following criteria:

- Need to be within the technical specification given in this document, and the user document referred above

- Need to be near term – projects sold, or projects about to be sold

Longer term projects may require additional functions or capabilities. Please feed that back to product management for consideration in next steps. TSAs may receive approval based on scope and time frame.

Support

Please refer to your regular business contacts.

The TSA id will be included in the license file of the actual 800xA license in order to be able to trace back to the approval.

Note that level 3 support will consider if an approved TSA is available in the case of production systems. Plants build with virtualization not having a TSA may receive support from level 3 and level 4 if time allows. See details on TSA procedure above.

Yours Sincerely,

System 800xA Product Management

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