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Certifying SAS® applications in a High Availability environment

New DSS Business Needs

For many years business applications such as: business performance reporting, operational data analysis, and marketing/campaign data analysis, etc. have been treated as "back-office" applications. This is where data creation from the day-to-day operation of the business is happening on transactional or operations systems and in off-hours the traditional Decision Support Systems (DSS) applications access the operational systems data and complete reporting and analysis jobs. Of course these requirements are still important, but a new class of DSS business needs has emerged. We now have the demand for almost continuous reporting and analysis during business hours and because of business globalization and the worldwide web "business hours" are now 24 hours by 7 days a week. Now businesses need faster turnaround of reporting and analysis that are critical to the day-to-day operation of their Business-to-Business (B-to-B) and Business to Customer (B-to-C) e-commerce operations. In this R&D Update we present the work HP and SAS are doing in making SAS applications continuously available, 24-by-7, to meet this critical business need for our customers.

For over 25 years, SAS software has been a leader in the DSS marketplace, providing powerful, robust software solutions for customers worldwide. As customer demands have evolved from back-office DSS requirements to Data Warehousing and Business Intelligence to E-Intelligence, Analytical Customer Relationship Management (A-CRM), Supplier Relationship Management (SRM), etc., SAS has not only kept pace but continues to lead the market with cutting-edge, high quality software solutions. So whether customers develop their own dedicated SAS applications or are using the integrated solution suites from SAS, HP can provide the Unix computer systems, high performance mass storage systems, middleware software and consulting know-how to meet stringent high availability (HA) requirements. In this report we present details about work jointly performed between SAS and HP in the HP Partner Technology Access Center (PTAC) to test, validate, and certify SAS Version 8 (V8) in a HP HA environment.

High Availability with HP MC/ServiceGuard

The HP Multi-Computer/ServiceGuard (MC/ServiceGuard) is a HA facility for protecting mission-critical applications from a wide variety of hardware and software failures. With MC/ServiceGuard multiple, up to 16 total, nodes (systems) are organized into an enterprise cluster that delivers highly available application services to LAN-attached clients.

HP MC/ServiceGuard monitors the health of each node and quickly responds to failures in a way that minimizes or eliminates application downtime. MC/ServiceGuard is able to automatically detect and respond to failures in the following components:

- System processors,
- System memory,
- LAN media and adapters,
- System processes,
- Application processes.

With HP MC/ServiceGuard, application services and all the resources needed to support the application are bundled into special entities called *application packages*. These application packages are the basic units that are managed and moved within an enterprise cluster. Packages simplify the creation and management of highly available services and provide outstanding levels of flexibility for workload balancing.

Integrating SAS V8 with MC/ServiceGuard

Integrating SAS V8 with MC/ServiceGuard provides redundancy and high availability for SAS V8. This integration provides:

- Minimal downtime in the event of a system failure,
- Automatic restart of running SAS jobs,
- Minimal delay before running SAS jobs are restarted,
- No reconfiguration of clients in a client/server environment (the ServiceGuard movement of the SAS server to another physical node is transparent to the client nodes).

In the configuration tested (see diagram below), one primary node was used (ptac171), with a second node initially not performing any SAS-related activity (ptac178) (standby node). Both the active and standby nodes were connected to a HP SC10 disk storage mechanism via Fast-Wide (FWD) Low Voltage Differential (LVD) SCSI connection. The SC10 contained the MC/ServiceGuard cluster lock disk, shared SAS files and instance information needed by both the primary SAS node and the standby SAS node (upon a failover).

Two remote nodes were connected via TCP/IP LAN. These remote nodes, running Windows NT, were simply used for telnet access to PTAC171 and PTAC178.

Configuration was as follows:

- Two packages were created. One package simply mounted the shared volume group. A second package was created which ran a shell script residing on the shared disk.

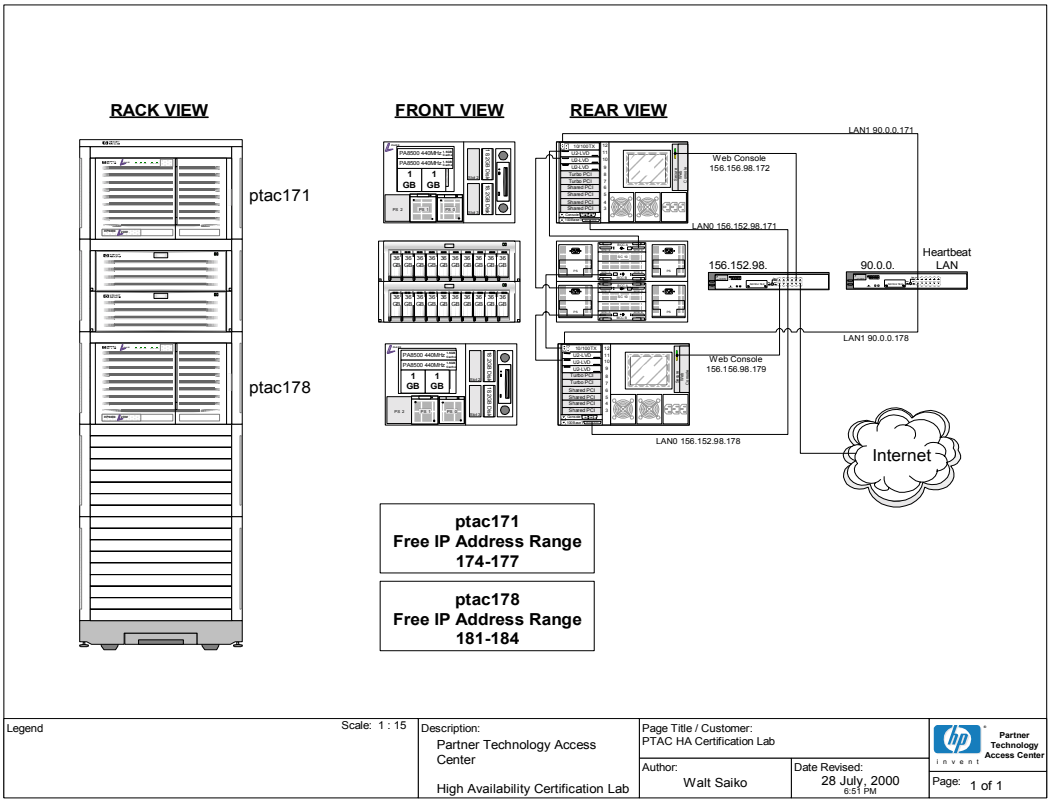
- The shell script invoked a SAS job, passing the SAS name of a source code file. A monitor script was written to monitor the SAS process. MC/ServiceGuard runs this script during package start. The monitor script will stay in a loop, checking for the existence of the SAS process. If this process goes away, a failover scenario will be initiated.

- A HA Monitor was configured as part of the second package, to monitor the physical connection to the shared disk containing the SAS binaries. MC/ServiceGuard maintained this monitor. If the connection to the shared disk was lost, MC/ServiceGuard would report this error, and initiate a failover scenario. This monitor was also configured as a package

dependency, i.e. the package depended upon this disk resource to perform its work. If the disk resource was not available, the package would not start.

The SAS V8 MC/ServiceGuard configuration consists of one package for the shared volume group, and another package for the SAS binary.

High Availability Configuration for SAS Testing



The result of this testing was the SAS V8 application was validated and certified by HP as compatible with HP's MC/ServiceGuard high availability software. The level of monitoring is highly configurable and subject to the implementation plans of the customer.

The testing, which was performed by engineers from HP's PTAC and HP's SAS Alliance Team, demonstrates that SAS V8 is compatible with MC/ServiceGuard. The tests show that if a node running a SAS job fails, the job can be restarted on an alternate node in less than 30 seconds, without human intervention.

MC/ServiceGuard packages are dependent on having automated application startup and shutdown scripts. HP engineers have developed package configuration and control scripts which are suitable for use (after system-specific modification) in a SAS V8 production environment.

Next Steps

For us…

HP and SAS continue to work together to further the integration of HA concepts into SAS solution architectures. We see a continued increase in the need for HA solutions for SAS applications to complement the advances in e-commerce/e-business for system availability and near real-time performance. We plan to deliver the technology and systems to keep pace with these needs.

For you…

If your SAS data processing requirements call for stringent high availability to meet the needs of the new age in information delivery contact us at HP to help you make your plan a reality. The documentation of this certified SAS HA solution is in place and available to HP Consultants and Application System Engineers (ASE). They will work with you to get your SAS HA environment up and running in record time.

To Learn More

We invite you to contact us to learn more about this project and the other activities jointly being done by SAS and HP that can benefit you. We can be reached on the web at:
www.unixservers.hp.com/partners/sas.

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