Making the evolution to Itanium®-based HP NonStop servers

Abstract.............................................................................................................................................. 3

This white paper addresses the process of system evolution. ........................................................... 3

Typical evolution scenarios .................................................................................................................. 3
- Modular storage I/O adapter module enclosure (IOAME) on S-Series systems .............................. 3
- ServerNet clustering ............................................................................................................................ 4
- S-Series system I/O ............................................................................................................................. 4
- Parallel systems ................................................................................................................................. 4

The evolution lifecycle: plan/design/implement/sustain .................................................................... 4

Hardware ....................................................................................................................................... 5
- Physical deployment ............................................................................................................................ 5
- HP NonStop Advanced Architecture (NSAA) .................................................................................. 5
- NonStop S-Series server hardware compatibility ......................................................................... 5

Data center ..................................................................................................................................... 6
- Power .......................................................................................................................................... 6
- Heat ............................................................................................................................................ 6
- Uninterruptible power supply (UPS) ............................................................................................... 6
- Extended runtime module .............................................................................................................. 7

IT computer operations ....................................................................................................................... 7
- OSM .......................................................................................................................................... 7
- Distributed Systems Management/Software Configuration Manager (DSM/SCM) OS Builder ....... 7
- Event messages ............................................................................................................................... 7
- Boot disks ......................................................................................................................................... 7
- Replacement of tape boot ............................................................................................................... 7
- Computer system operations run book.......................................................................................... 7

Operating systems and middleware .................................................................................................. 7
- Operating systems ........................................................................................................................... 8
- HP middleware products ............................................................................................................... 8
- Middleware from third-party vendors ........................................................................................... 8
- Compatible NonStop S-Series server software .............................................................................. 8

Applications software ......................................................................................................................... 8
- Overview ...................................................................................................................................... 8
- Recompilation of native applications ............................................................................................. 8
- Resources .................................................................................................................................... 9
Abstract

The purpose of this document is to assist HP NonStop server customers and service delivery professionals with making the transition from HP NonStop S-Series servers to Itanium®-based HP NonStop NS-Series servers. By providing a basic understanding of the evolutionary process, this document helps build an awareness of the key areas to be considered when moving to the new platform.

Although the terms “evolution,” “migration,” and “upgrade” are often used interchangeably, they have distinctly different meanings:

- **Evolution** is a process of gradual progressive change, which may incorporate product migrations and/or upgrades.
- **Migration** is the move to a replacement product, such as “D” to “G” operating system release versions.
- **Upgrade** is the move to a new version of the same product, such as G06.17 to G06.24 or S86000 to S88000 CPUs.

This white paper addresses the process of system evolution.

Typical evolution scenarios

The evolution scenarios described in the following sections offer strategic choices that meet a wide variety of business requirements.

**Modular storage I/O adapter module enclosure (IOAME) on S-Series systems**

- Data and databases as well as network and communications resources can be migrated onto the modular storage I/O (MSIO) infrastructure connected to the S-Series platform. This is a possible first step in a strategic evolution plan.
- Connecting MSIO to S-Series platforms achieves faster disk access through Fibre Channel disk modules (FCDM) and Enterprise Storage Subsystems (ESS) connectivity. These solutions also support a wide range of networking and communications products, increasing connectivity options for S-Series or NonStop NS-Series.
• Once in production with IOAME on the NonStop S-Series, it is easy to move these resources to the NonStop NS-Series servers. This is easily accomplished by replacing the multimode fiber (MMF) cabling from S-Series cabinets with a multimode fiber cable connected to the Itanium-based NonStop ServerNet switches within the server racks. This operation supports minimal service interruption.

ServerNet clustering
• ServerNet clustering gives Expand-capable applications the ability to take advantage of high-speed, low-latency connectivity between systems. This makes it possible to leave database and communications environments—either on MSIO or within existing S-Series I/O enclosures—on S-Series platforms.
• This scenario makes it possible to move application components into the new NS-Series server environment in phases, reducing fall-back considerations and impact on applications. This scenario also allows continued access to products that are not supported on the new NonStop platform.
• Expand over IP continues to be supported.

S-Series system I/O
Itanium-based HP NonStop servers allow up to 24 S-Series I/O Multifunction Unit 2 (IOMF2) cabinets to be directly attached to the new environment, protecting investment in existing storage, I/O, and communications equipment.

Parallel systems
This scenario, which is typical of a 911 emergency or healthcare solution, requires new and old systems to run in parallel for a period of time in order to:
• Stabilize the new hardware, software, and application environments
• Synchronize databases
• Allow validation, certification, and acceptance testing
• Prevent downtime

The evolution lifecycle: plan/design/implement/sustain

Each of the evolution lifecycle phases should address eight domains. Because each NonStop environment is unique, discussion of these domains is intended only as a guide to considering the impact of the evolution to the new servers. Considering these domains in the context of the solution lifecycle and carefully planning necessary changes have the effect of reducing risk—a key objective—and delivering a successful evolution.

The eight information technology (IT) domains are:
• Hardware
• Data center
• IT computer operations
• Operating systems and middleware
• Applications software
• Networking and communications
• Data and databases
• Management practices
Hardware

Hardware considerations include the physical aspects of deployment, architecture, configurations, and interoperability with current S-Series hardware.

Physical deployment
All HP rack-mountable products fit in industry-standard 19-inch-wide racks. Note that racks and rack-mountable components are typically described in “U” (unit) measurements, with one U standing 1.75” (44.45 mm) high. The standard rack for deployment of this next-generation NonStop hardware will be 42U high, 600 mm wide, and 1100 mm deep, and it will accommodate future modular NonStop server equipment.

HP NonStop Advanced Architecture (NSAA)
Leveraging industry standards, the new NonStop architecture is designed from the ground up to prevent any downtime of customers’ applications.

For more information about HP NonStop Advanced Architecture, please see the article at: http://h71033.www7.hp.com/object/ADVARCWP.html

NonStop S-Series server hardware compatibility
The Itanium-based NonStop server family supports most NonStop S-Series server hardware within the S-Series enclosures:

- IOMF2 and S-Series enclosures for IOMF2
- ServerNet cluster switches
• ServerNet communications adapters
  – 3960 ATM3SA 1-Port Asynchronous Transfer Mode (ATM) Adapter
  – 3862 TRSA 1-Port Token Ring Adapter
  – 3861 E4SA 4-Port Ethernet Adapter
  – 3863 FCSA 1-Port Fast Ethernet Adapter
  – 3865-C GESA 1-Port Gigabit Ethernet for copper cabling
  – 3865-F GESA 1-Port Gigabit Ethernet for multimode fiber cabling
  – AWAN, SWAN, SWAN 2 (may also be used with modular G4SA adapter)
  – No ServerNet/FX support
  – 6763 SS7—Communications Controller ServerNet Adapter
  – SS7TE2 T1, E1, J1 Plug-In Card for 6763
  – SS7TE3 100Mbps Ethernet Plug-In Card for 6763
  – SS7TE1 not supported

• Disks
  – 4609, 4618, 4619, 4636, 4637, 4672

• Tapes
  – 4 mm digital audio tape (DAT), super data link terminal (DLT), DLT7000, TSI 9840, TSI L700
  – Fibre Channel Interface for CTL700 can attach to Fibre Channel ServerNet Adapter (FCSA)

The Itanium-based NonStop servers are not compatible with processor multi-function (PMF) or modular ServerNet expansion boards (MSEBs). They do not support ServerNet/FX or ESCON.

Please contact your HP representative for a complete list of hardware products moving to the new platform.

Data center

Power
Three power input options are available:

• Three-phase, 120/208 Vac (common in North American and Japanese sites)
• Three-phase 220/380, 230/400, or 240/415 Vac (common in Europe and other locations outside of North America and Japan)
• Single-phase 200/208/220/230/240 Vac (common in Europe and other sites outside of North America and Japan)

Heat
Because the new generation of Intel® Itanium microprocessors has increased power requirements, consideration must be given to server placement and cooling efficiencies in order to provide adequate cool air flow.

Uninterruptible power supply (UPS)
Modular I/O was architected to accept either an internal UPS or a site UPS. Customers need only buy the internal UPS for installation in the modular I/O cabinet if their site does not have a UPS to support continuous operation of the NonStop server components. HP recommends using an internal UPS if a site UPS is not available.
Extended runtime module
The UPS for modular I/O subsystems supports the addition of a battery pack that extends runtime when power is lost. This battery pack is also installed in the modular I/O cabinet.

IT computer operations
Though IT operations around the new NonStop platform will be much the same as with the S-Series, there are a few significant differences, as described in the following sections.

OSM
HP NonStop Open System Management (OSM) replaces Total System Management (TSM). OSM on NS-Series systems is very similar to the OSM available on the S-Series. You might want to upgrade from TSM to OSM on S-Series prior to moving to NonStop NS-Series servers. For more information, please visit http://h71033.www7.hp.com/object/NSCOSMXWP.html#9.

Distributed Systems Management/Software Configuration Manager (DSM/SCM) OS Builder
Most customers do not interact at a level below the Distributed Systems Management/Software Configuration Manager (DSM/SCM) interface. However, if you have been using Sysgen directly, OS Builder replaces Sysgen.

Event messages
The new NonStop Advanced Architecture deploys new Event Management Service (EMS) messages that must be addressed in run books or event monitoring tools, as appropriate.

Boot disks
The new Itanium-based NonStop servers can boot from S-Series disk enclosures or Fibre Channel disk modules (FCDMs).

Replacement of tape boot
Tape boot has been replaced by the requirement for a spare or alternative disk containing a system image. This disk should be part of the live system, such as an alternative $system disk.

Computer system operations run book
It is important to review, update, and test the computer system operations run book throughout this evolution to the new servers. Each change affects system operation during procedures, such as the following:

• Backup
• Power failure
• Power-up
• Data recovery
• Data connection/lines/circuit switching, shut down, and restart
• Application software pause, shut down, and restart
• Other event message handling

Operating systems and middleware
IT should conduct an inventory of all software to determine which packages will move to the new NonStop platform.
Operating systems
• The change from million instructions per second (MIPS) to Intel Itanium architecture also requires a new generation of software. The new designation for this release versioning is “H.”
• The new NonStop servers replace shared resource libraries (SRLs) with dynamic link libraries (DLLs).

HP middleware products
Most independent products (IPs) available on the HP NonStop S-Series server family are available with the new platform. Appropriate software licenses must be purchased.

Please contact your HP representative for a complete list of middleware products and versions moving to the new platform.

Middleware from third-party vendors
The HP NonStop Enterprise Division is launching a program to provide Itanium-based NonStop hardware and software to partners to validate their solutions and verify solution readiness before first customer ship (FCS). For more information, visit the following URL:

Compatible NonStop S-Series server software
Most NonStop S-Series software will be available on the new platform. The following conditions apply:
• Only products in active and mature product management lifecycle (PML) status six months prior to FCS will migrate forward.
• Product numbers will change.

For the current HP NonStop platform software product maintenance list (SPML), please visit http://h71033.www7.hp.com/page/NS_SWrelsupp.html.

Contact your HP representative for a current list of system update tape (SUT) and IP products that are not moving to the new platform.

Applications software
Overview
• The new NonStop servers run existing native MIPS applications after recompiling the software from the source code.
• Applications based on complex instruction-set computing (CISC) can be interpreted or accelerated without recompilation for full binary compatibility.
• Software application migration is simple and straightforward.
• There will be new debug environments.
• A key objective during evolution is to keep business applications available to users with no—or very little—planned downtime.

Recompilation of native applications
It is necessary to recompile Code 700 file types to Code 800 file types. The application development environment for native languages is available on Itanium-based NonStop servers in both the Guardian and OSS environments and on PCs running Microsoft® Windows® with the HP Enterprise Tool Kit (ETK), NonStop Edition.
Resources
For information on migrating software applications to Itanium-based NonStop servers, please consult the HP white paper on this subject, available at:

Networking and communications
Most network and communications protocols are moving to the new HP NonStop server.
Synchronous Wide Area Networks and Asynchronous Wide Area Networks (SWANs and AWANs) can move directly to new Ethernet controllers connected via IOAME; SWANs and AWANs connected via S-Series enclosures can be directly attached to the Itanium-based NonStop servers.
Contact your HP representative for a current list of communications products moving to the new platform.

Data and databases
Continuous, uninterrupted access to data and databases during system evolution is a key objective. Many HP and third-party products can assist in the following ways:
• S-Series enclosures can be directly attached, preserving data and hardware investment.
• FCDM/Enterprise Storage Subsystems (ESS) are Fibre Channel connected, offering improved performance.
• FCDM/ESS support industry-standard 512-byte sectors. Online disk re-mirroring supports data migration from 514- to 512-byte sectors.

Management practices
Business and IT management must consider whether evolution to the new platform makes sense. Return on investment (ROI) calculations can be helpful in making the decision. The opportunity to meet additional business requirements, such as new services for end customers or internal functional groups, may also be an important consideration. These and the following management concerns must be considered throughout evolution:
• Business cases, business planning, program management, contingency planning, and business continuity planning
• IT staff training on topics including
  – Best practices and effective technology use around IT system operations and management
  – Software development
  – Database administration
• Resource scheduling
• Project/Program management
• Budgets and justification

Key evolution solutions from HP Services
IT management typically wants—and needs—to reduce both the risk of evolving to a new platform and the time this evolution requires. In many cases, managers seek vendor assistance with procedures and best practices related to planning, deployment, and ongoing management.
Customizable services for before and during implementation

HP Services offers the following suite of customizable services to reduce risk and speed time to solution across the evolutionary process. An HP Web site with more information about these evolution services can be found at www.hp.com/hps/servers/sr_nonstopevol.html.

- **Assessment Service**—This service helps IT managers develop a detailed understanding of the requirements for a successful evolution. Key focus areas are business-critical applications and their interface with other IT systems. HP Services experts recommend evolution scenarios and provide an evolution assessment report, an evolution assessment presentation, and a proposal for an evolution infrastructure planning and design service.

- **Infrastructure Planning and Design Service**—This service enables a business to increase the benefits of system evolution through success-oriented planning and design. HP Services consultants work with customers to develop a holistic approach that examines areas of the operating environment that might be affected. HP Services presents a detailed project plan and other deliverables that are designed to lessen impact on business functions and personnel.

- **Data-Center Thermal Analysis Service**—This energy-efficient “smart cooling” approach can dramatically reduce the energy required to cool thermo-mechanically complex data centers through the use of modeling and metrology. HP consultants perform computational fluid dynamics (CFD) modeling of airflow and temperature characteristics to optimize the cooling design of the data center.

- **Pilot (Proof of Concept) Service**—HP Services designs and builds a functional test of critical applications representing a customer’s workloads under simulated, test, or controlled access. We measure and report findings and recommendations in an evolution pilot final report and an evolution pilot executive presentation.

- **NonStop Service Solutions**—HP Services provides a packaged set of installation and integration services to configure, initialize, and test your new system hardware and software. Additional evolution implementation services can be custom-crafted to meet your business and IT service management needs, helping you to implement a production-ready, application-ready NonStop platform in the shortest possible timeframe. For more information about NonStop Service Solutions, visit www.hp.com/hps/servers/sr_nonstop.html.

Mission Critical Services for ongoing operations

After an Itanium-based NonStop server solution has been installed and deployed, HP Services offers a suite of Mission Critical Services to support ongoing operations. Structured to assist IT staff in achieving the business goals of the new NonStop server solution, these services are both reactive and proactive in nature. For more information about Mission Critical Services from HP, please visit www.hp.com/hps/mission/.

NonStop Technical Services for IT management best practices

NonStop Technical Services help you implement IT management best practices to cost-effectively focus on specific management goal—including enhancing availability, performance, security, and operations—across your NonStop environment. Designed to complement the NonStop Service Solutions, these highly proactive offerings are custom-tailored to your business and IT objectives. For more information about NonStop Technical Services, please visit www.hp.com/hps/mission/mi_technical.html.
For more information

For more information about how HP Services can assist you in the evolution to the Itanium-based NonStop server, please visit www.hp.com/hps/servers/sr_nonstopevol.html.