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course description

OpenVMS v7.3 galaxy and NUMA programming and internals u3722s

course overview

The OpenVMS Galaxy software architecture provides the software foundation to best exploit the features of NUMA systems. This course provides a foundation for programming and troubleshooting an OpenVMS Galaxy platform.

audience

OpenVMS system managers and application programmers

benefits

The newest AlphaServer GS series systems support a Non-Uniform Memory Architecture (NUMA). NUMA presents new issues of which the programmer and troubleshooter must be cognizant. OpenVMS provides support for Resource Affinity Domains (RAD) that allow you to control some of the aspects of the NUMA environment.

pre-requisites

To get the most from this course, students should have:

- Completed the Alpha Programming Features I and II courses.
- The ability to read and ideally write code in VAX macro.
- Ability to program in the DEC C Language.
- Completed OpenVMS Alpha Internals I and II courses.

course objectives

Students attending this course should leave with an understanding of:

- How to write code that will detect and effect CPU transitions, use Galaxywide Shared memory for communications, use Galaxy Locks for synchronization, obtain RAD information, affect RAD-based memory allocation, and change the home-RAD of a process.
- How OpenVMS internally supports the NUMA and Galaxy platforms.
- The data structures that support the Galaxy environment, so as to better troubleshoot problems, should they occur.

next steps

N/A

to order

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detailed course outline: OpenVMS v7.3 galaxy and NUMA programming and internals U3722

module	key topics
the GMDB and CPU transitions	<ul style="list-style-type: none">• galaxy management database (GMDB)• locating node blocks• inter-processor interrupts• galaxy configuration tree• system event notification• CPU management programming interface
resource affinity domains	<ul style="list-style-type: none">• non-uniform memory access (NUMA)• resource affinity domains (RADs)• obtaining RAD information• the RAD_SUPPORT SYSGEN parameter• home RADs• soft RAD affinity scheduling• RAD support for process code and data• controlling global page allocation• RAD distribution of system memory
galaxywide shared memory sections	<ul style="list-style-type: none">• galaxywide shared memory sections• support for galaxywide shared memory sections• locating SHM_REG and SHM_DESC arrays• shared memory and the PFN database
galaxy locks	<ul style="list-style-type: none">• share page tables• OpenVMS galaxy locks• galaxy lock characteristics• galaxy lock system services• galaxy locking routines• galaxy lock structures• releasing galaxy lock waiters

for more information

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