Networking over SSA

Preliminary Study Report

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Program Goals

- Provide applications using existing networks to migrate transparently to SSA networking

- Allow a single SSA adapter to support both storage and network I/O

- Minimize overheads in protocol support and over the SSA web

Approaches

- A. Define a new TCP-like protocol to provide the same services to applications as TCP/IP and UDP/IP but without the overhead and functions redundant to SSA transport.

- B. Alternately, define an efficient means to tunnel IP datagrams between SSA nodes adding minimal protocol to that imposed by TCP/IP and UDP/IP

SSA-TCP PROTOCOL

- Connection oriented service application interface consists of OPEN(), CLOSE(), SEND(), RECEIVE(), STATUS(), and ABORT() service calls, with asynchronous event notification to application.

- Connectionless service application interface consists of SendTo(), ReceiveFrom() and CreateRcvPort() calls, with asynchronous event notifications.

- Defines an interface with transport layer that cleanly divides the layers and permits other protocols to share transport managed resources.

SSA-TCP Protocol (contd.)

- Most header-resident protocol handshakes are converted to SMSs, 7 new SMS commands, 6 new reply SMSs. Use of SMSs replaces TCP header. IP header unnecessary with SSA Transport.

- Handles connection loss and repathing/multipathing

- 8k transfer incurs 6%-9% total overhead

- Transport interface could be made more generic for other serial transport layers.

IP over SSA

- Minimal preliminary work done to date, mostly exploring possible means to implement.

- One approach is to create SMSs to perform the work of IP headers, similarly to SSA-TCP

- Alternate approach is to use dedicated channels for IP data and embed socket information in headers of fixed length packets

- Represents lower efficiency bandwidth usage of SSA, but much smaller software effort across multiple operating systems

Current Program Status

- SSA-TCP document ~75% complete, requires ~1 man-month to complete

- SSA-IP document not started. Study needs ~1 m-m to complete and document another m-m

- Pathlight is currently evaluating the need for networking over SSA and the priority for dedicating the resources

Unresolved Issues

- Microsoft and some other operating systems architectures do not permit the use of the same device by both storage and network drivers, making dual use difficult without "cheating" in hardware

- Vendor-Unique or ANSI Standard ULP code?