

Date: 1/9/04
To: T10 Committee (SCSI)
From: George Penokie (IBM/Tivoli)
Subject: SAS UML Corrections

4 General

4.1 Architecture

4.1.1 Architecture overview

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Figure 6 shows the class diagram for a SAS domain, showing the relationships between SAS domain, SCSI domain, service delivery subsystem, expander device, expander port, SAS device, SCSI device, SAS port, SCSI port, and phy classes. Relationships to ATA classes (e.g., ATA domain) are not shown in figure 6.

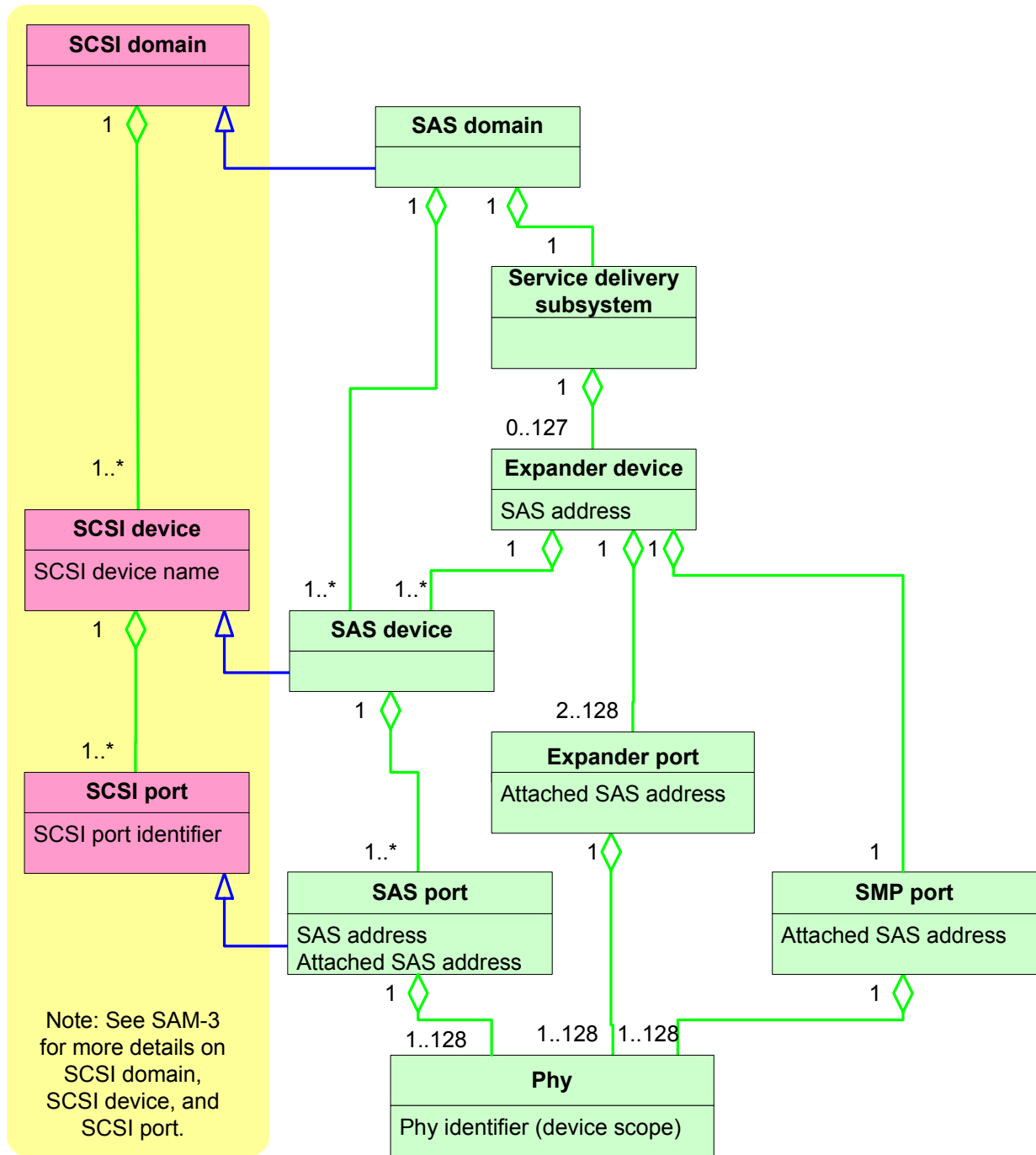


Figure 6 — SAS domain class diagram

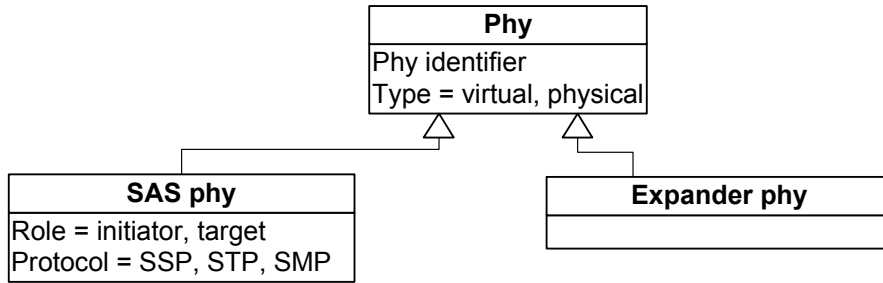
4.1.2 Physical links and phys

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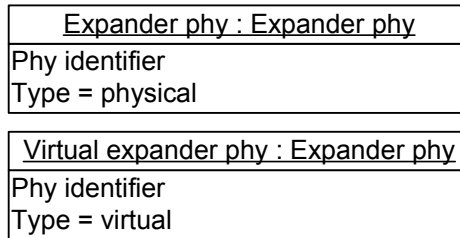
Figure 7 shows phy classes and the objects that are instances of the SAS phy and expander phy classes, showing the relationships between phy, SAS phy, and expander phy classes and the SSP initiator phy, SSP target phy, STP initiator phy, STP target phy, SMP initiator phy, SMP target phy, virtual SSP target phy, virtual

SMP target phy, virtual STP target phy, expander phy, and virtual expander phy objects. SATA phys are also referenced in this standard but are defined by SATA (see ATA/ATAPI-7 V3).

The objects of the SAS phy class shown in figure 7 are only valid and unchangeable during a connection. A different object may be used on a different connection.



Valid objects for the expander phy class



Valid objects for the SAS phy class

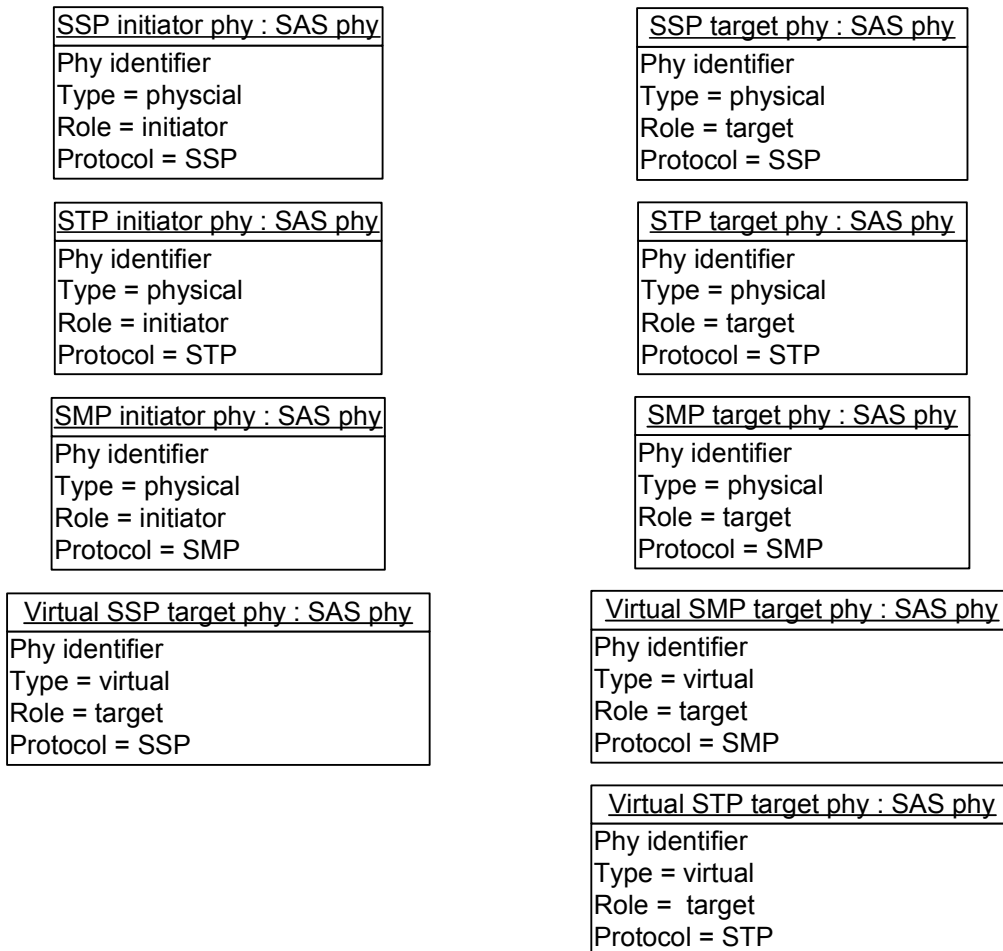


Figure 7 — Phy classes and phy objects

Figure 8 shows an expansion of the SAS phy class, showing the relationships between phy, SAS phy, SAS initiator phy, SAS target phy, SSP phy, STP phy, and SMP phy objects. SATA phys are also referenced in this standard but are defined by SATA (see ATA/ATAPI-7 V3).

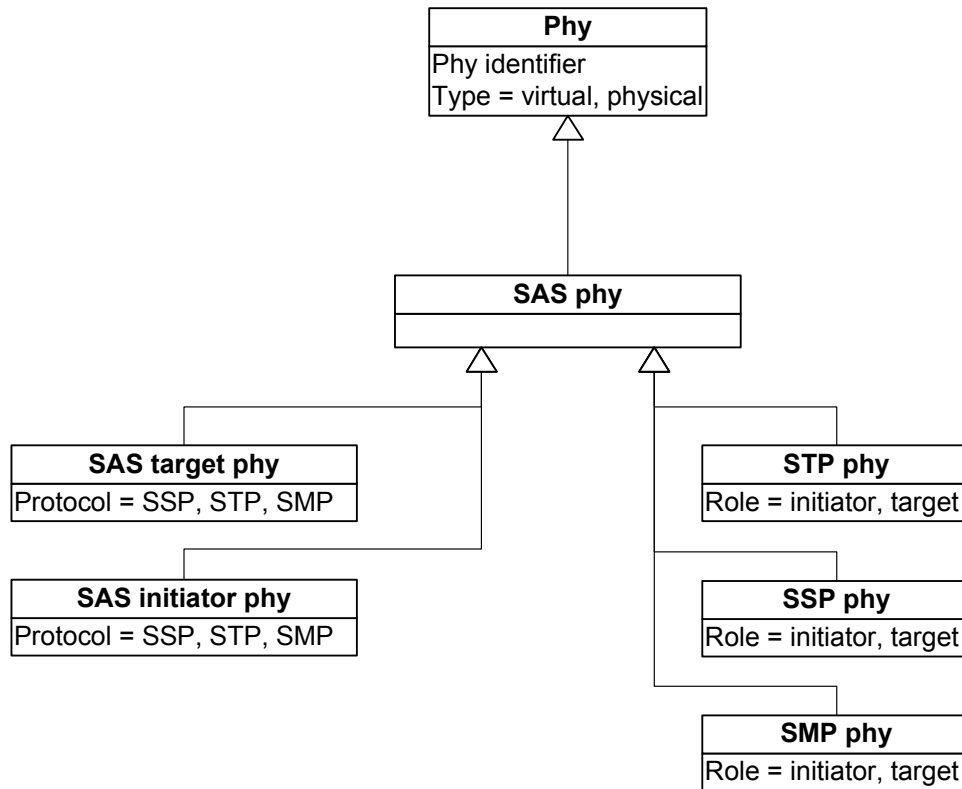


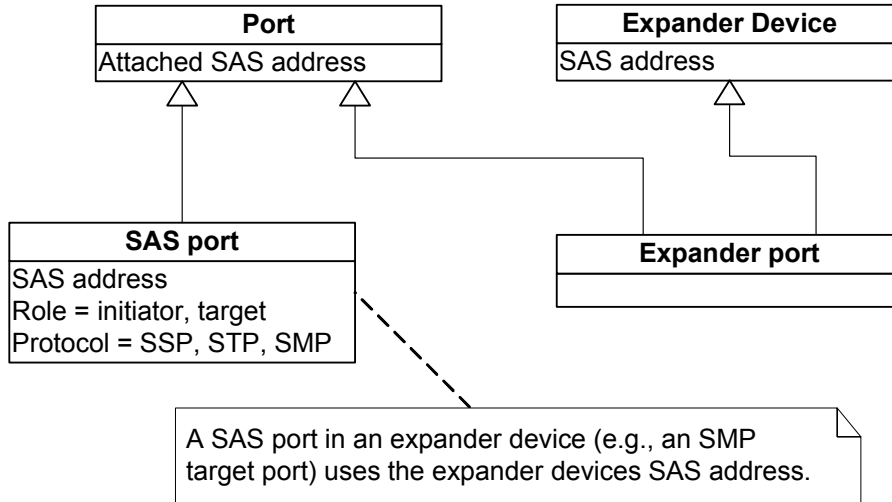
Figure 8 — SAS Phy classes

4.1.3 Ports (narrow ports and wide ports)

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Figure 9 shows the port classes and the objects that are instances of the SAS port and expander port classes, showing the relationships between port, expander device, expander port, and SAS port classes and the SSP initiator port, STP initiator port, SMP initiator port, SSP target port, STP target port, SMP target port, and expander port objects.

The objects of the SAS port class shown in figure 9 are only valid and unchangeable during a connection. A different object may be used on a different connection



Valid objects for the SAS port class

Valid objects for the expander port class

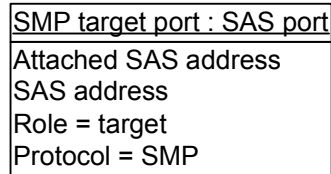
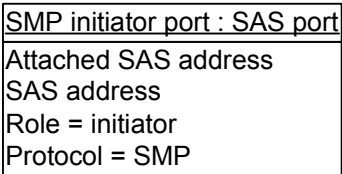
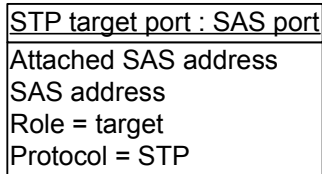
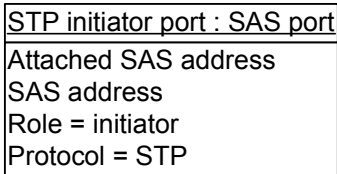
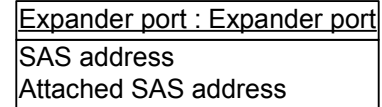
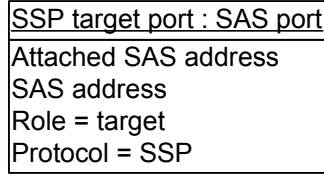
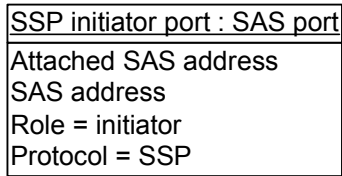


Figure 9 — Port classes and port objects

Figure 10 shows an expansion of the SAS port class, showing the relationships between port, SAS port, SAS initiator port, SAS target port, SSP port, STP port, and SMP port classes.

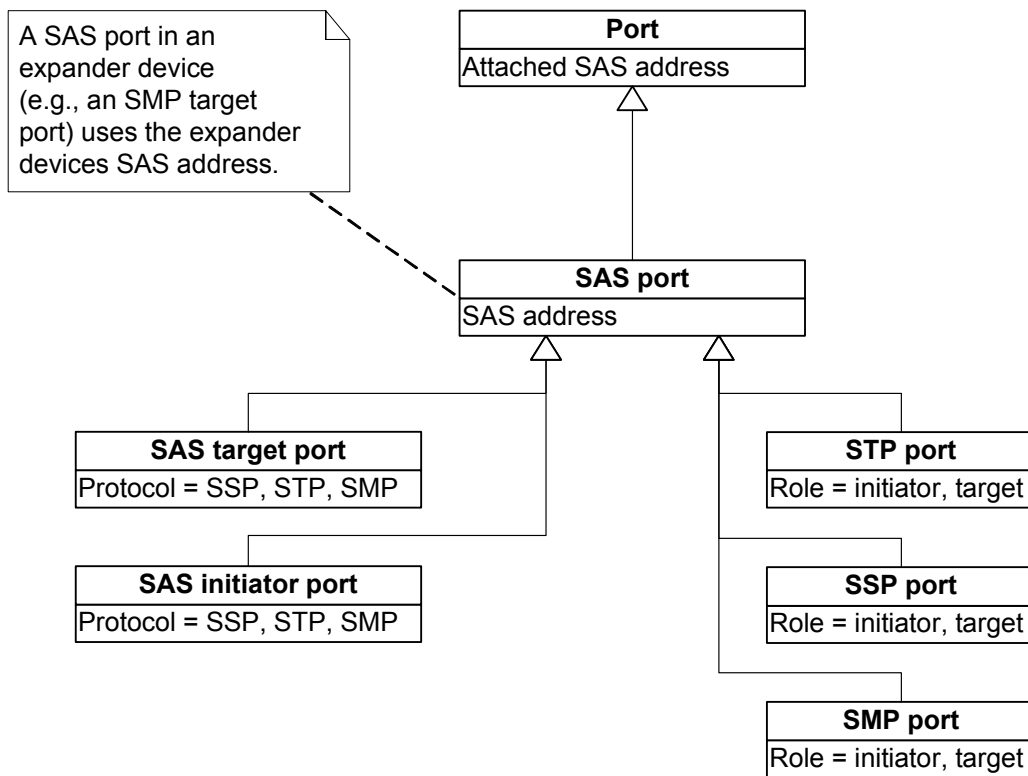


Figure 10 — SAS Port classes

4.1.4 SAS devices

4.1.5 Expander devices (edge expander devices and fanout expander devices)

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Figure 11 shows the expander device classes.

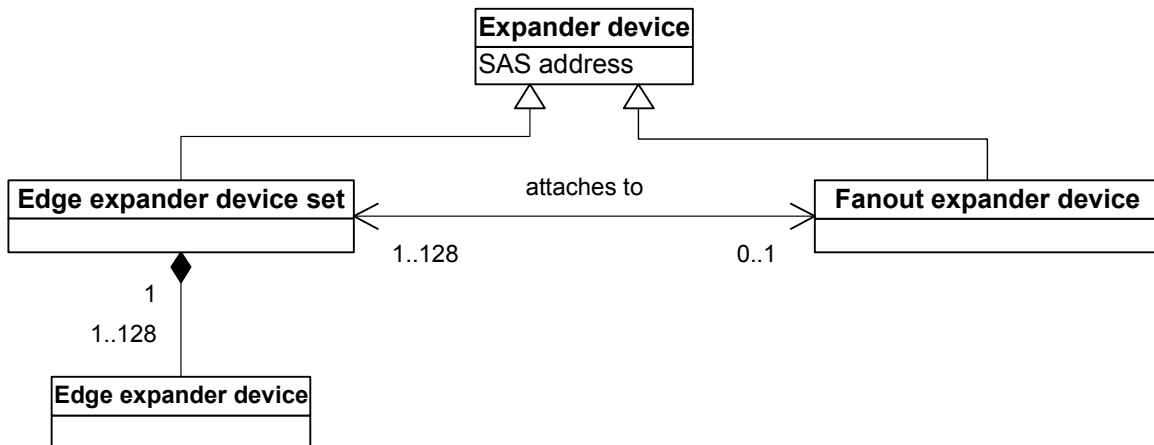


Figure 11 — Expander device classes

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4.1.6 Service delivery subsystem

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4.1.7 Domains

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4.1.8 Expander device topologies

4.1.8.1 Expander device topology overview

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4.1.8.2 Edge expander device set

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4.1.8.3 Expander device topologies

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4.1.9 Pathways

| ...

4.1.10 Connections

| ...

4.2 Names and identifiers

4.2.1 Names and identifiers overview

| ...

4.2.2 SAS addresses

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4.2.3 Hashed SAS address

| ...

4.2.4 Device names

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4.2.5 Port names

| ...

4.2.6 Port identifiers

| ...

4.2.7 Phy identifiers

| ...

4.3 State machines

4.3.1 State machine overview

Figure 12 shows the state machines for SAS devices, their relationships to each other and to the SAS device, SAS port, and SAS phy.

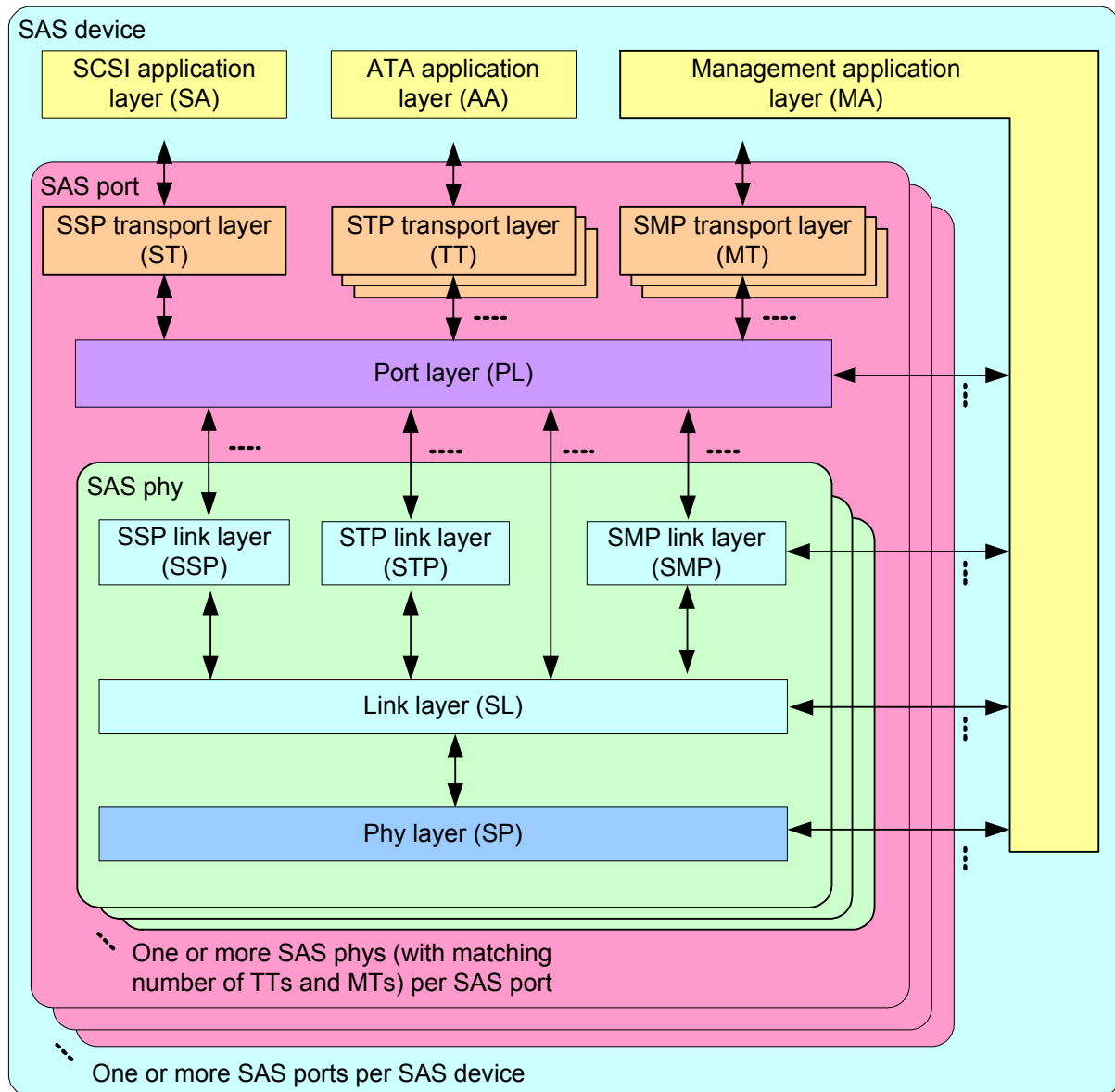


Figure 12 — State machines for SAS devices

Figure 13 shows the state machines for expander devices, their relationships to each other and to the expander device, expander port, and expander phy. Expander function state machines are not defined in this standard, but the interface to the expander function is defined in 4.6.6.

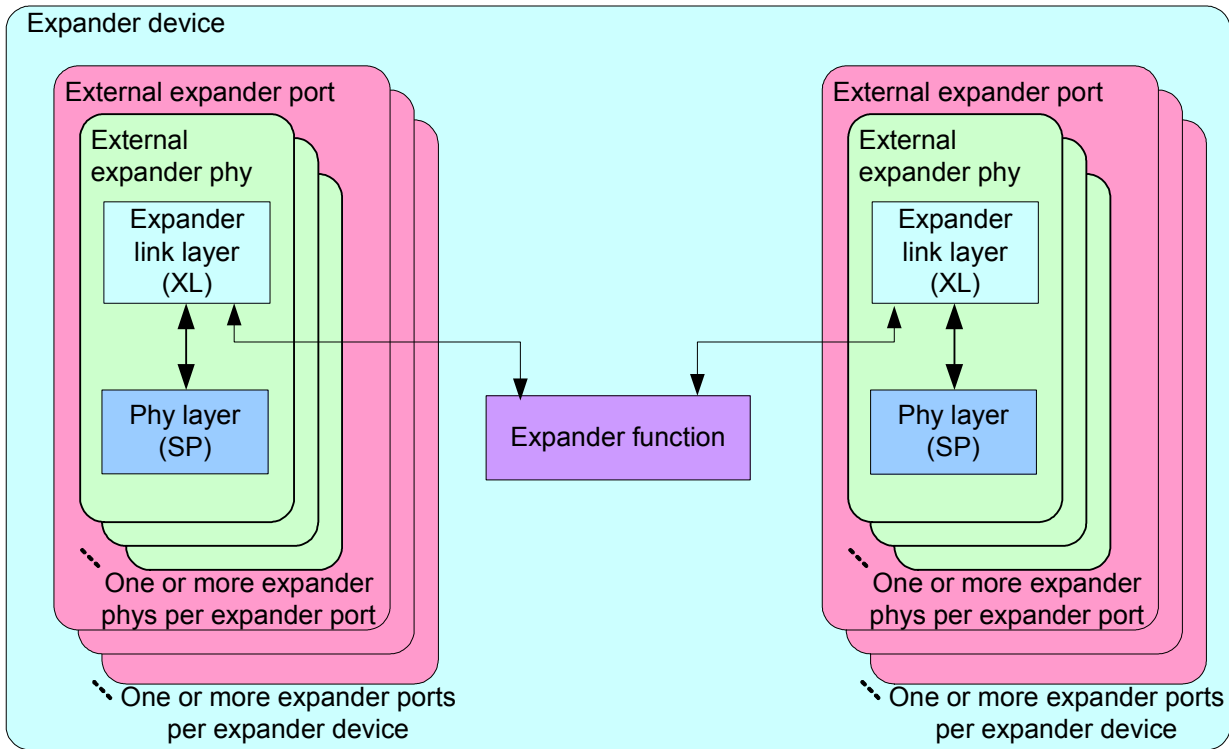


Figure 13 — State machines for expander devices

Annex I contains a list of messages between state machines.

4.3.2 Transmit data path

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4.3.3 State machines and SAS device, SAS port, and SAS phy objects

Figure 14 shows which state machines are contained within the SAS device, SAS port, and SAS phy classes.

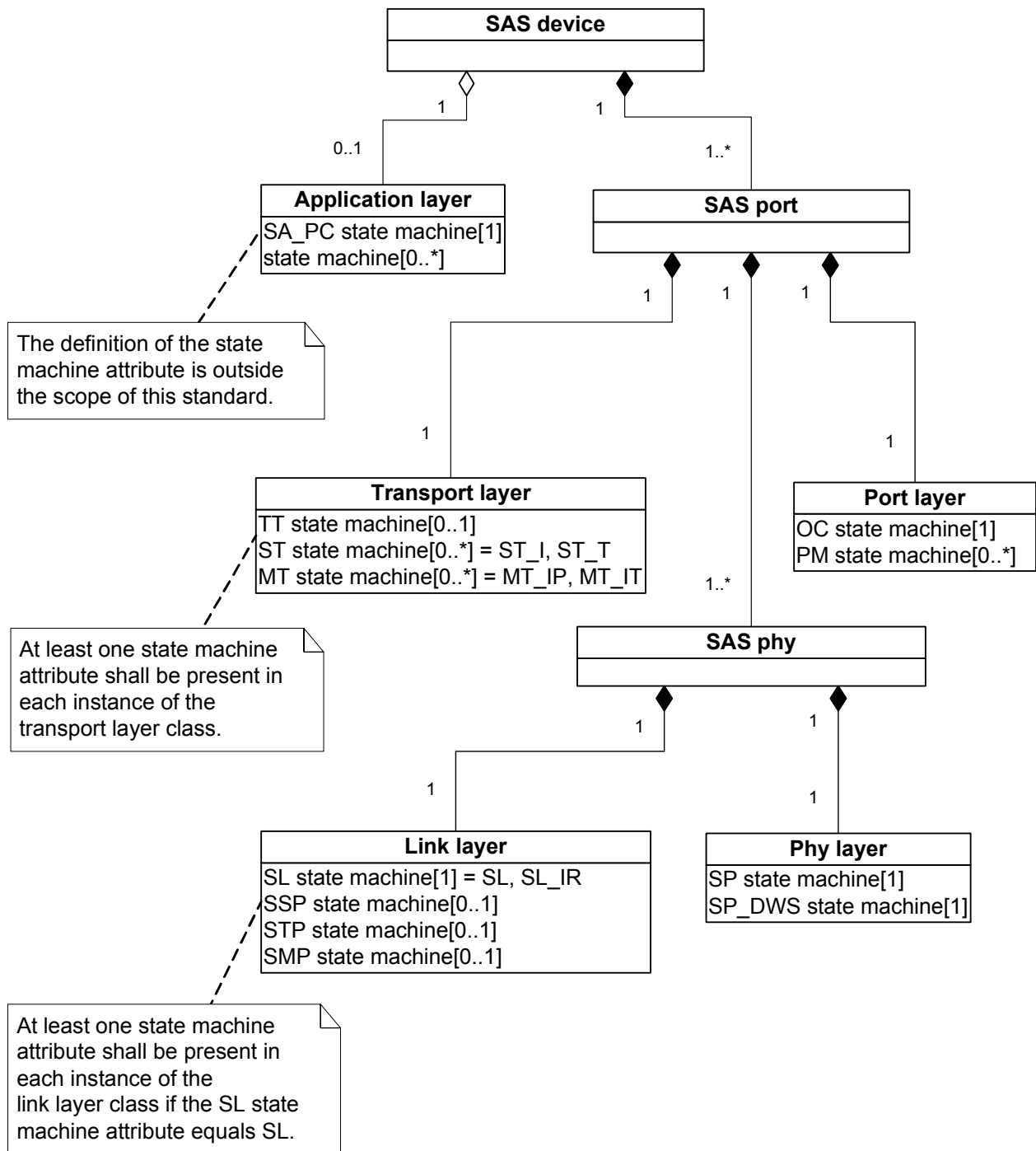


Figure 14 — State machine and SAS device, SAS port, and SAS phy classes

Figure 15 shows which state machines are contained within the expander device, expander port, and expander phy classes.

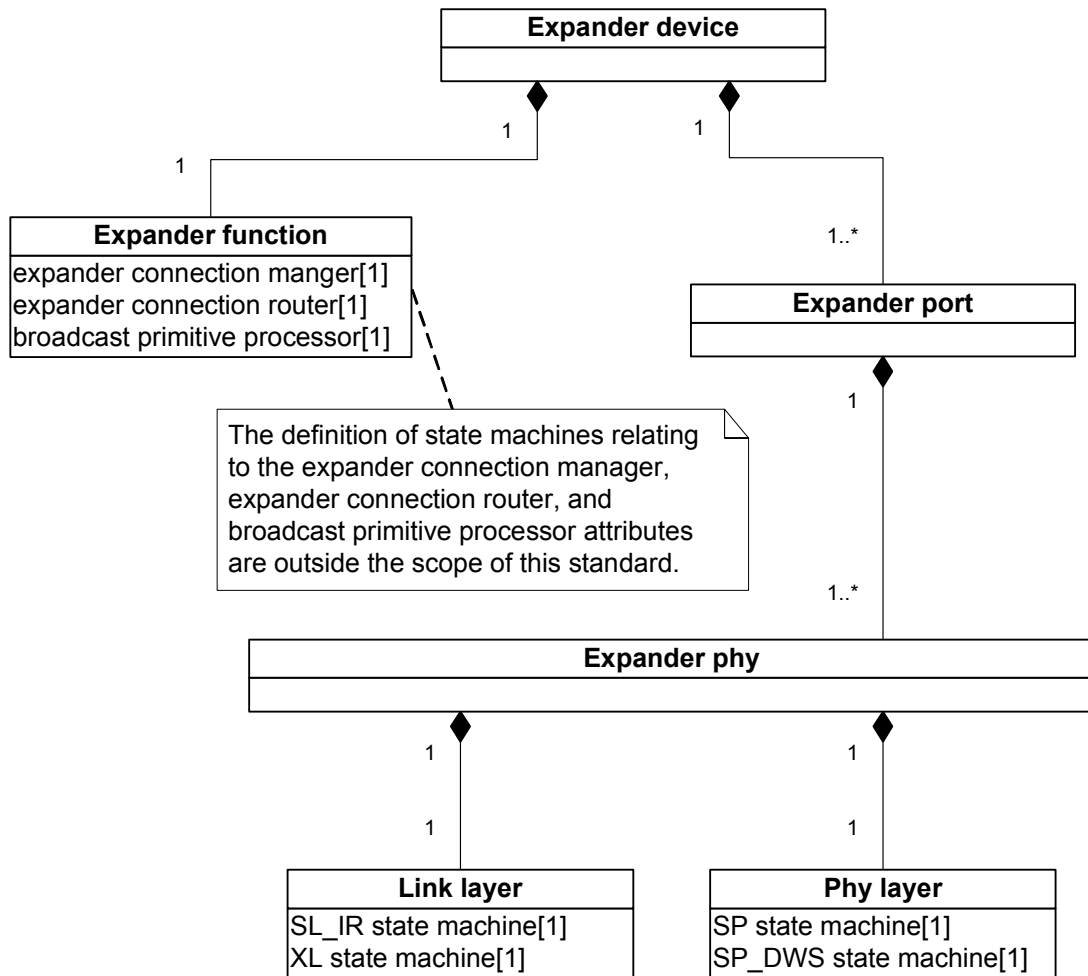


Figure 15 — State machine and expander device, expander port, and expander phy classes