

# RPR Over SDH/SONET Protection Interaction

S. Jose IEEE 802.17 Meeting – Sept 2001

Vittorio Mascolo – Alcatel



- ▼ Introduction
  - ◆ Scope of the presentation
  
- ▼ RPR ring over deployed Metro SDH/SONET Fibre Ring .
  
- ▼ Conclusion

- ▼ There are a lot of already deployed Metro SDH/SONET Fibre Rings. Analyze some scenarios to figure out how RPR resiliency capability could interact with deployed SDH/SONET ring protection systems.
- ▼ Single ring scenario.
  - ◆ RPR deployed over unprotected trail (like Virtual ring built over a meshed netw.).
  - ◆ SDH/SONET ring with full RPR traffic.
  - ◆ SDH/SONET ring with mix of RPR and SDH traffic.

## Scope of the presentation

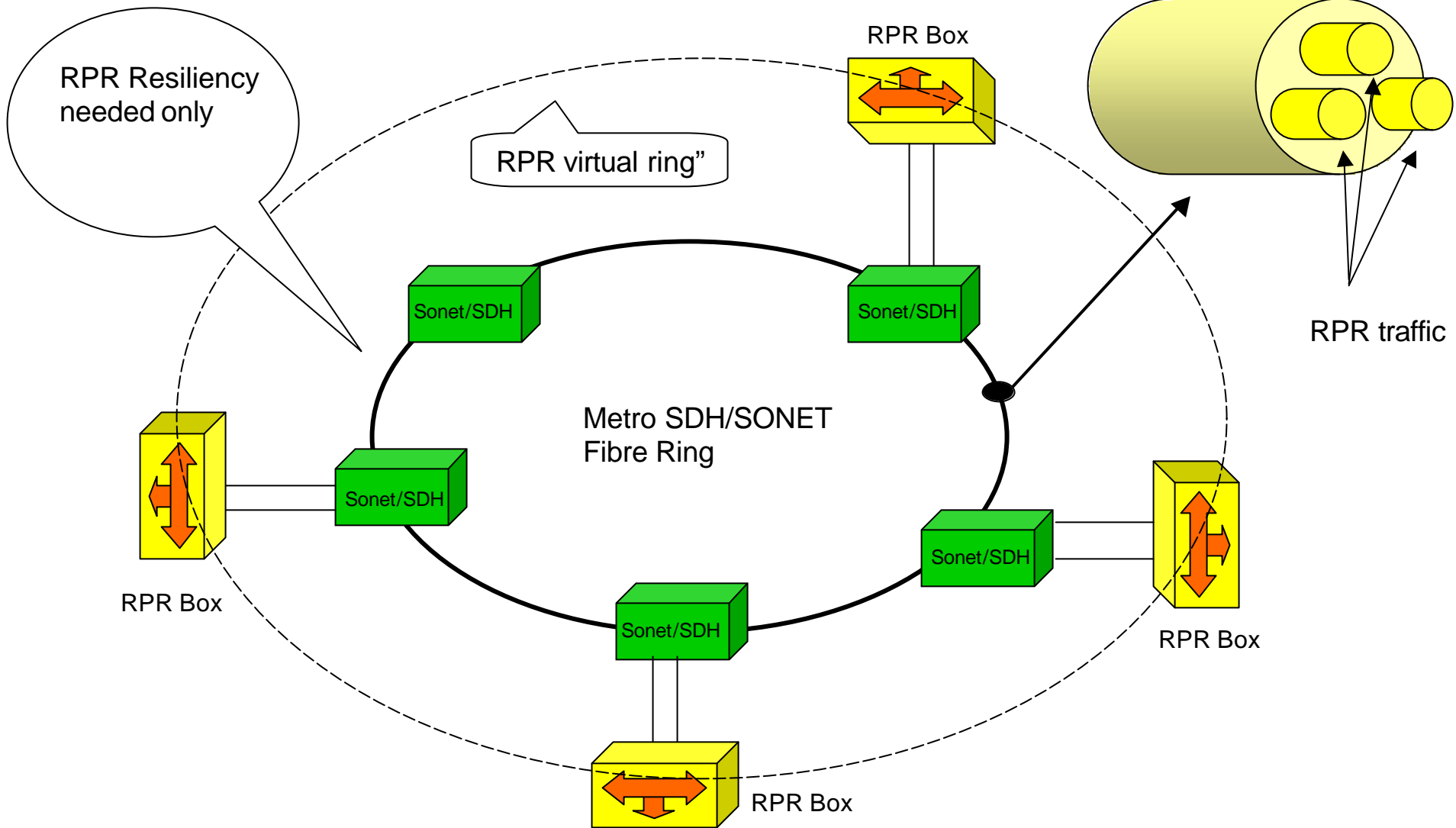


- ▼ Define an **HOLD-OFF-TIME** requirement to allow easy interoperability between RPR resiliency capability and SDH/SONET systems when a failure ring occurs.

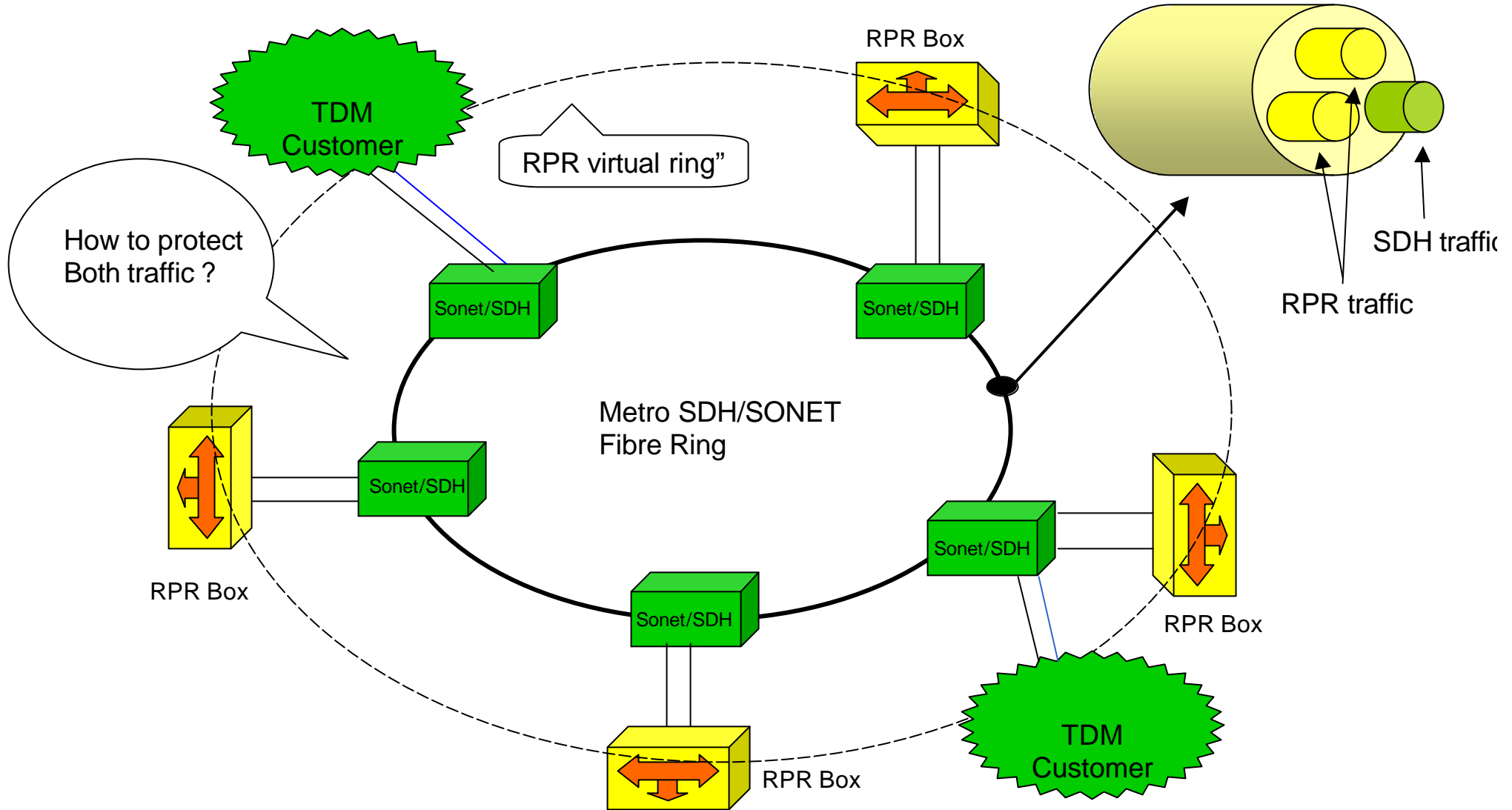


- ▼ An RPR ring can be built over a deployed Metro SDH/SONET Fibre Ring. The RPR boxes connect themselves through the physical path SDH/SONET connections .
- ▼ RPR uses one VC4 or VC4-xc, VC4-xv (STS-3c or STS-12c SPEs) in the working channels . Each VC4 (SPE) is protected by another VC4 (SPE) belonging to the protection channel.
- ▼ Two possible scenario from the behaviour point of view.
  - ◆ RPR deployed over unprotected trail or the whole ring carries RPR traffic only (same behaviour).
  - ◆ both RPR and Sdh/Sonet traffic are involved on the same ring.

# RPR over unprotected trail or full RPR traffic - scenario



- ▼ RPR resiliency is the suitable solution (SDH/SONET ring protection disabled).
  
- ▼ RPR must grant the maximum level of protection:
  - ◆ Switch in case of **SF (Signal Fail)**.
  - ◆ Switch in case of **SD (Signal Degrade, optional)**
  - ◆ **Hold-off timer is NOT needed** (RPR must provide fast protection).
  - ◆ **Wait Time to Restore (WTR) timer is needed** (to avoid problems with fast trilling alarms).







- ▼ The RPR resiliency and Sdh/Sonet ring protection must interoperate, but not work together !
- ▼ The SDH/SONET shared ring reacts at Multiplex Section Level using the protection channel (ITU-T G.841).
- ▼ **If RPR Resiliency manages a properly set Hold-off time** no MAC protection is required and link stays UP, unless failure is again present when Hold Off Time expires.
- ▼ Both the RPR and SDH traffic are kept alive by means of the SDH/SONET ring switching.



- ▼ For the most type of failures that affect the ring, RPR and SDH traffic, when they coexist, can be saved by SDH/SONET ring protection capability.
- ▼ RPR MAC should support **hold-off time** and **signal detection (SF, SD optional)** in order to use some facilities of the SDH/SONET Shared Protected Ring.
- ▼ RPR MAC should support **Wait-to-restore** timer.