

When the control plane of a network switch runs Linux: abuse of technology becomes possible

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About me



Anatomia di uno switch

CLI

OS

Control plane

Silicon for switching

Proprietary black box

I peccati della CLI (just a few...)

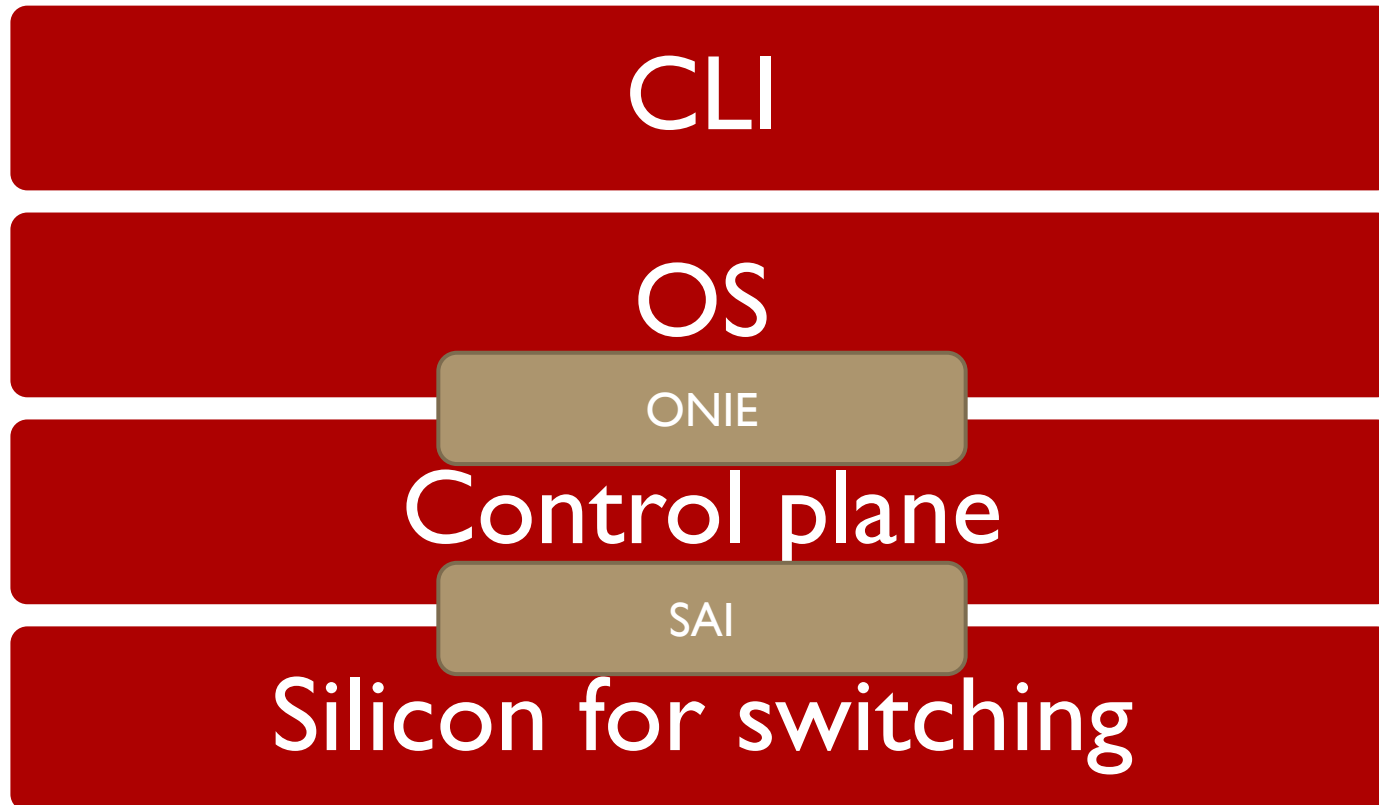
pros

- ▶ startup-config: quasi stateless...
- ▶ int range te0/0 – 47: foreach implicito
- ▶ Know-how disponibile
- ▶ Configurazione ispezionabile

cons

- ▶ gi1/0: ma ti sembra un nome???
- ▶ (quasi)Human-bound
- ▶ Assenza di API (*Ops)
- ▶ Weak vendor lock-in
- ▶ No automation

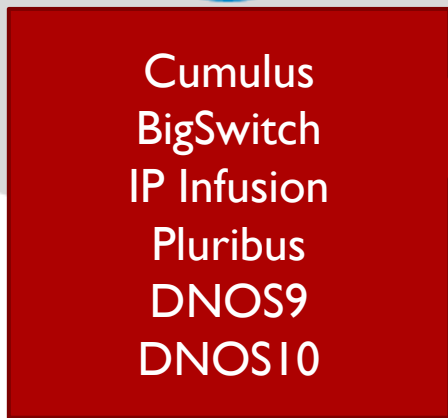
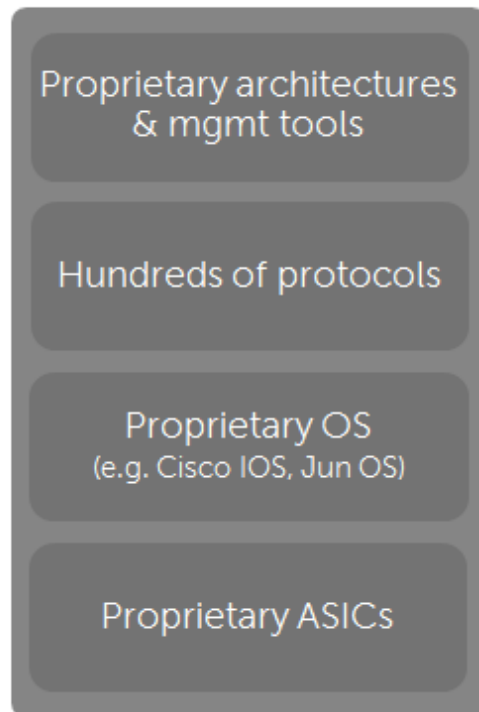
Anatomia di uno switch vNext



Disaggregating the switch (Dell view)

The future of networking

Traditional networking



Linux sul control plane!!!

CLI

- Static configuration
- Crafted DSL

Shell

- Inefficient for port configuration
- Install your own software
- Automation

An OS shell

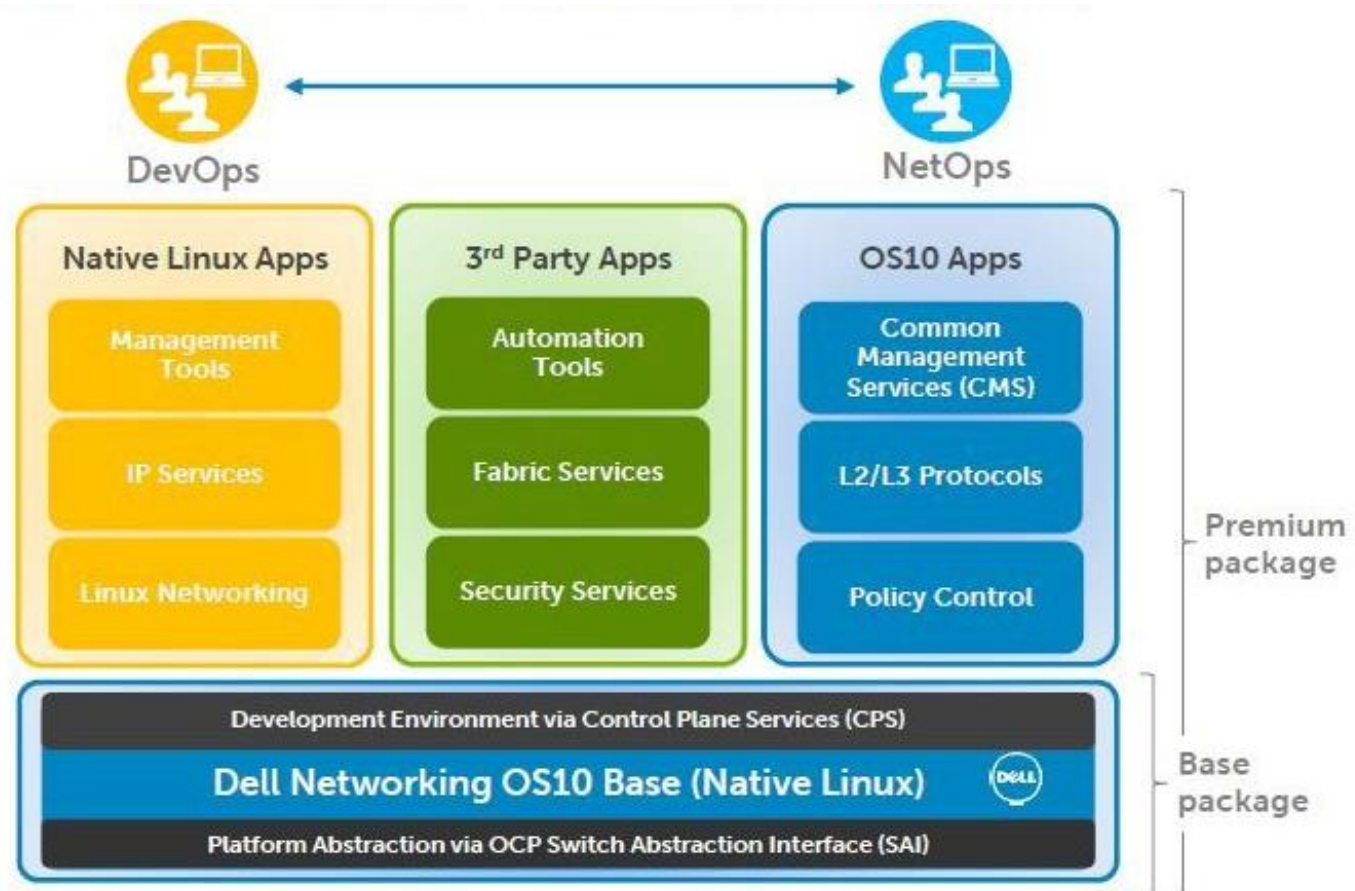
pros

- ▶ Automatizzabile
- ▶ Non-monolithic Update process
- ▶ Know-how orientato a un mondo iperconvergente
- ▶ Abbandono di un modello puramente funzionale

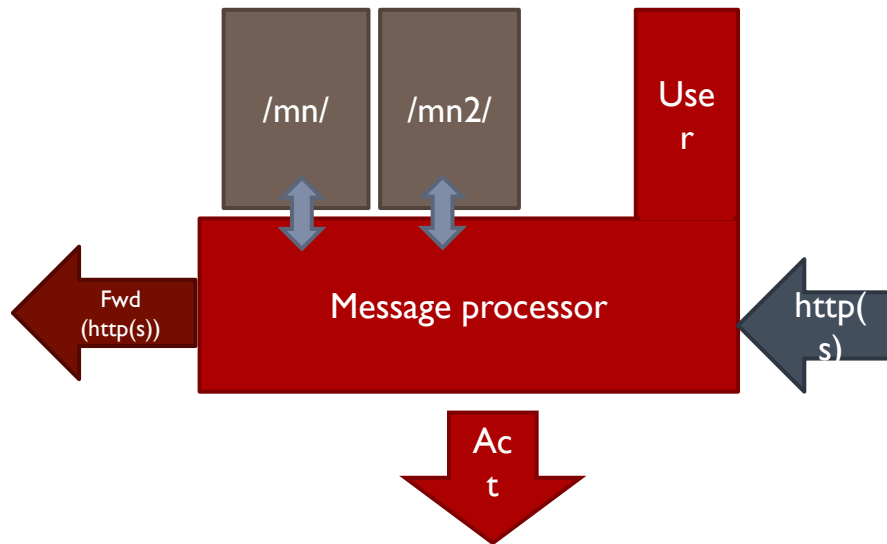
cons

- ▶ Troppo stateful (a meno di CPS e similari)
- ▶ E il reboot?
- ▶ Rischio frammentazione
- ▶ Controllo delle risorse?
- ▶ Ispezione della configurazione più complessa
- ▶ (transient) Supporto incompleto feature L2

Dell Networking OS10

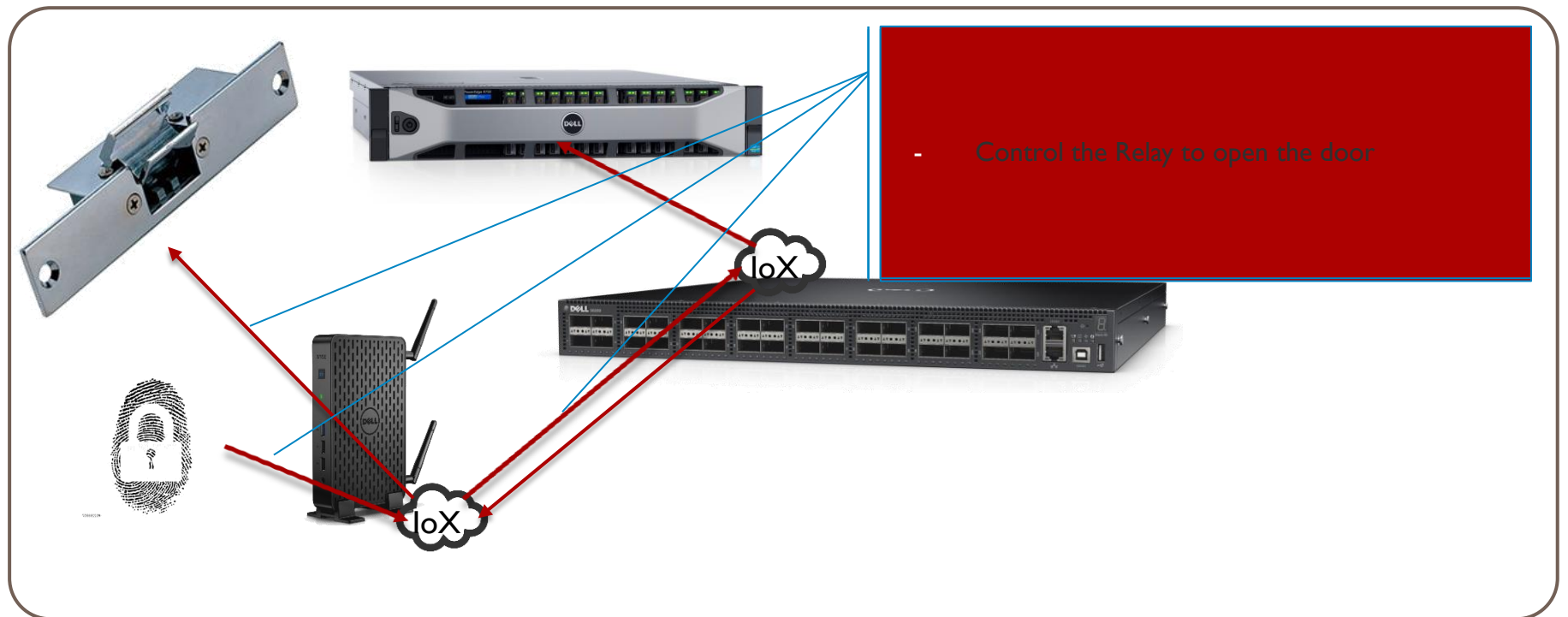


IoX: a runtime for IoT



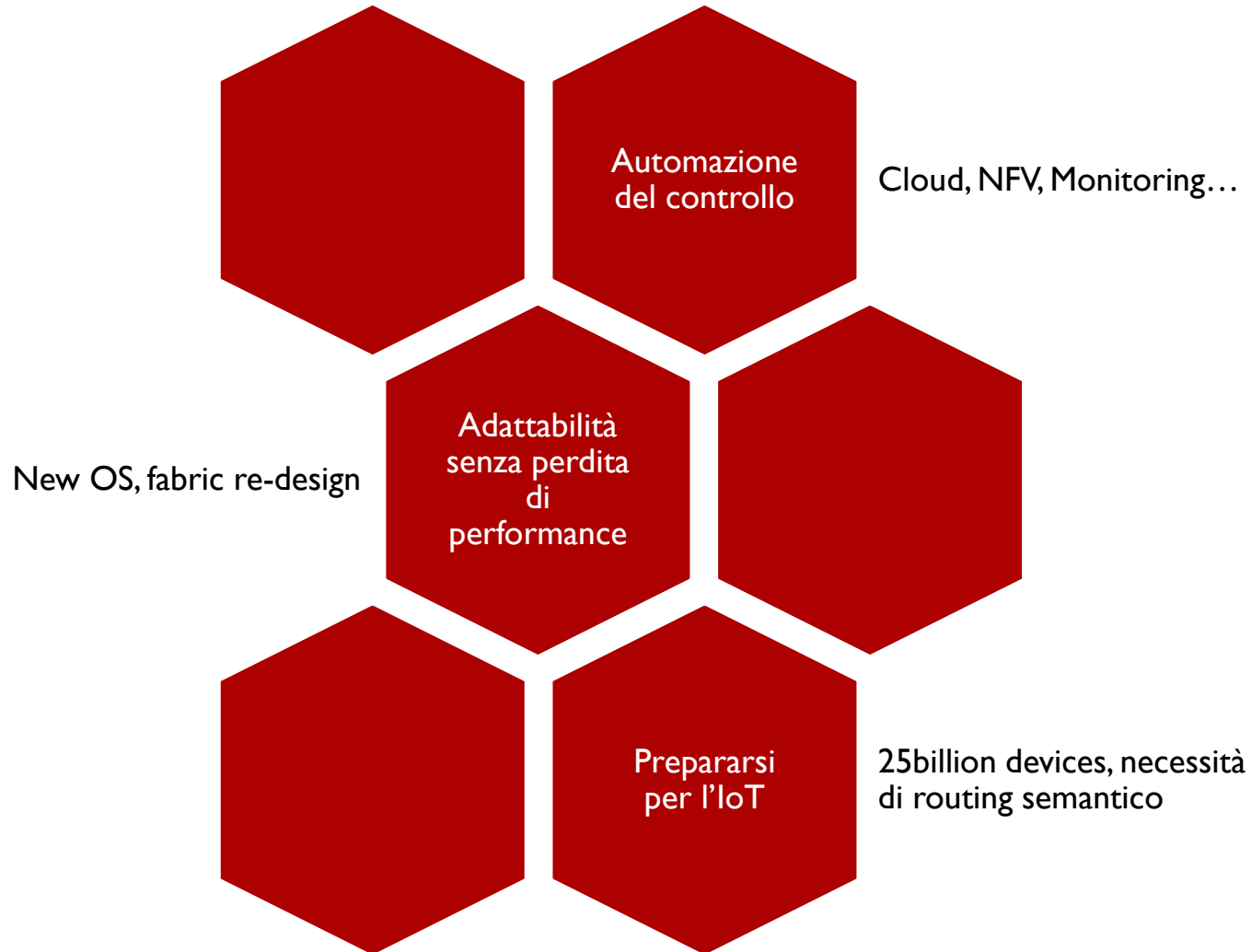
- ▶ Runtime
 - ▶ .NET + F# + Suave
 - ▶ CLI with F# interactive
 - ▶ Event based processing with evReact
- ▶ Vendor modules register for http prefixes
- ▶ Module isolated in process using .NET core capabilities
- ▶ inject message processors in the processing runtime
- ▶ User can express global rules for inspecting JSON messages
- ▶ Modules can offer HTML5 UIs
- ▶ Action may include Interop with host environment (i.e. network switch)

A curious example



Demo

Should I stay on board? Of course!



Conclusioni

- ▶ La disaggregazione dello switch porterà grandi cambiamenti nel networking
- ▶ Se il control plane diviene un PC, allora lo switch può assumere ruoli nuovi:
 - ▶ Monitoring
 - ▶ Pro-active reconfiguration
 - ▶ Seamless integration and coordination
- ▶ L'incremento dei device connessi dovuto all'IoT la gestione delle configurazioni sarà troppo complesso da mantenere manualmente