LSDN — Manage complex (virtual) networks in cloud environment with Linux kernel facilities

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Motivation

- Tool for easy management of data-center scenarios
- Using TC as a workhorse, no other dependency such as OvS
- Attempt to be “high-level” and easy to use
- Validate TC capabilities and limits in such a deployment
- Leverage rapid development of TC
- Attempt to provide a lot of features without a long-running daemons
- Fix some bugs in kernel (Not original motivation)
What We Can Do

- Support for virtual networks, switches and ports
- Network overlay
- Multi tenancy
- Stateless firewall
- QoS
- API for management via C-library
- DSL (Domain Specific Language) for stand-alone management
Network Model

- Virtual networks (**nets**)
  - **geneve, vxlan, vlan**
  - Identifier **VID** from the underlying technology
- Physical Machines (**physes**)
  - Connected to one or more **nets**
  - Usually real physical interface, e.g. **eth0**
- Virtual machines (**virts**)
  - Always part of one **net**
  - Live on one of **phys**, can migrate
  - Usually some **tap** interface
- All lives in one **context**
- Validation can be used for finding errors
- **Commit** validates and applies changes
LSDN provides 2 styles of configurations:

1) C API
   - Library `liblsdn`
   - For integration with orchestartors, hypervisors ...
   - Just link `liblsdn` and use it

2) `lsctl`
   - Command line tool
   - Tool for stand-alone configuration
   - Uses C API
   - Own DSL based od TCL
   - `lsctl < config.lsctl`
• C API and lsctl example
• Modular testing system example
• Generated TC rules
LSDN is a network management tool on top of TC (Data-center like scenarios)

Packages for Arch, RPM and DEB based distributions

Minimal dependencies → Trivial for trying out

Fixed various bugs in upstream:
- 4 in net part of Linux Kernel
- 1 in iproute2

Future plans:
- Stabilize the project
- Migrations without daemon
- Stateful firewall
- ...