Volume Encryption Architecture

Provides Encryption on OpenStack Block Storage Resources

**Goal:** Automatically encrypt VM volume. Encryption is transparent to VM, and is a similar concept to self-encrypting drives

**Steps for block encryption:**
- **Preparatory Step:** Cinder creates data volume
  1) Nova API call
  2) iSCSI volume appears as block device in compute host
  3) Retrieve volume’s encryption key
  4) dm-crypt maps decrypted version of iSCSI volume
  5) Decrypted iSCSI device passed to VM

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Diagram:
- **Nova**
  - User VM
  - API Call
  - Key
  - dm-crypt
  - Virtualization Host
  - Hypervisor

- **Cinder**
  - Key Management Appliance
  - Network

- Proposed encrypted mount (LibvirtDriver.attach_volume)