

WarpDrive SoW (v1)

“A system to accelerate the availability of data by maintaining structure on a Copy-On-Write capable inline device, further reducing bandwidth, disk space and disk I/O usage.”

Goal

1st deliverable (this SOW)

Future deliverable

Environment

Configuration

Security

Operating System Level capabilities

Performance

Reliability

GUI

Disaster management and recovery

Monitoring

Testing and validation

1. Goal

The goal is to productize the current Methodics Warpdrive R&D prototype in the form of 2 deliverables

1st deliverable (this SOW)

Develop, test and release of a virtual appliance that will perform as per specifications described below (v1)

Future deliverable

- A hardware appliance built specifically for WarpDrive usage
- this is coming later (not part of this SOW) and is contingent on a successful 1st deliverable

2. Environment

- 2.1. Minimal KVM appliance with latest Debian & kernel stable
- 2.2. Operating system should be upgradeable easily in order to enable security patches and new kernels

- 2.3. A mechanism to upgrade the ZFS filesystem layer of the kernel and guarantee 1-version backwards compatibility of data or handle data migration if required
- 2.4. Environment shall provide SSH access for management tasks
- 2.5. A built-in smoke test suite: A simple test that tests the vitals of the system and tests the stack **(2.6)**
- 2.6. Create warpdrive filesystem over NFS and/or locally, generate random data, snapshot data, clone snapshot, modify dataset, promote dataset, export dataset, mount dataset, verify data, unmount dataset, destroy dataset.

3. Configuration

- 3.1. virtual appliance should be buildable via a single script or automated process
- 3.2. Environment specific configuration should be handled via a template (format TBD)
- 3.3. virtual appliance environment configuration needs to be modifiable at runtime.
- 3.4. Template should be used at build time **(3.1)** and for modifications at runtime **(3.3)**

4. Security

- 4.1. MDX will own root. sysadmin/sysops can be added to the sudoers file (commands TBD)
- 4.2. Environment should be secure and not expose any unnecessary ports to the outside world
- 4.3. System needs to honor NFS ACLs and related user permission bits

5. Operating System Level capabilities

- 5.1. System shall provide snapshotting, cloning, clone promotion, NFS exporting and Copy-on-write capabilities at the filesystem layer via either a python-compatible library (v2) or user space tools (zpool, zfs) (v1).
- 5.2. ZFSonLinux shall be used unless mentioned otherwise.
- 5.3. System shall be able to use NFS mounts, files, drives, block devices as datastore for the filesystem datasets holding snapshots and clones
- 5.4. System shall be able to NFS export COW clones individually once created (ZFS sharenfs)
- 5.5. System shall be able to produce WarpDrive filesystem usage metrics of operations and associated metadata (Operation/second) on top of available performance metrics such as (zpool iostat)
- 5.6. System shall be able to expose usage metrics in an industry standard form (snmp ?).

6. Performance

- 6.1. System shall support LACP bonding (if hardware supports)
- 6.2. System shall be as close to wireline speed as possible in terms of networking protocols (NFS).
- 6.3. System shall produce consistent, repeatable, documented results under specific datastore configurations (NFS, files, disks, ..)
- 6.4. System shall be tested for concurrent access and concurrent operations
 - 6.4.1. the limits will be documented and understood.

7. Reliability

- 7.1. System shall be testable for reliability and should be able to generate reliability numbers

8. GUI

- 8.1. No GUI deliverables at this time
 - 8.1.1. A dashboard will be planned in a future release (v2?)
- 8.2. System will provide CLI tools to manage the virtual appliance.

9. Disaster management and recovery

- 9.1. The system will come with a set of procedures that will guarantee reasonable data recovery in case of a catastrophic failure.
- 9.2. An exhaustive list of possible catastrophic failures and recovery procedures will be documented.

10. Monitoring

- 10.1. System should be monitoring itself and report any failures via syslog

11. Testing and validation

- 11.1. Develop a reusable performance and functional testing suite/framework for the virtual appliance
- 11.2. WarpDrive datasets need to pass industry-standard file system tests (TBD)