# Levanta Takes Management Pain Out of Linux

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## Management Summary

Business agility these days is no laughing matter.  With a growing variety of competitors nipping at its vulnerabilities, an enterprise has to be prompt in its response to threats and opportunities – like the bicyclists in the Tour de France that seize the slightest opportunity to overtake the opposition.  Many businesses find themselves bound by the limitations of the IT systems that were supposed to be their competitive salvation.  This is not a matter of the systems themselves, which have gotten more quickly reactive and less costly each year, but of their management which, has not improved to keep pace with the scale and diversity of enterprise systems.  Frequent changes to IT environments are mandated by the pace of change in business, and these changes must not imperil enterprise systems.  Safe change in IT environments, particularly if they are large, can be a time-consuming process.  But, of course, the world will not slow down to accommodate this.

Many of the system management enhancements of the last few years have made the tasks of system administrators less time consuming – there are fewer steps – but at the same time the interrelated nature of business processes make each step a more complex procedure.  Virtual machines provide a coupling layer that can make deployment seem easier – but does not improve patch management or troubleshooting - and can even make them harder.  A redesign of how IT administration is done depends on a thorough knowledge of the operating system involved, and how its control mechanisms operate.  It is most easily possible if the operating system has been built to be used in a wide variety of situations.  Linux is such a system.  It is an operating system comprised of files, and is inherently manageable in an enterprise sense.

Levanta, one of a clutch of companies focused on Linux management, has taken a deep heritage in Linux and used it to evolve Linux management from a procedural litany to a transactional orientation that can be optimized by its Intrepid appliances.  Based in San Mateo, CA, Levanta offers the Linux-loving enterprise a way to make their infrastructure flexible, robust, well-managed and well-documented.  If you would like to see the magic that Levanta appliances bring to the table, and how they make Linux environments, but real and virtual, ideal for all kinds of enterprise applications, please read on.

## The Levanta Way

The power of networks has enabled the centralization of IT administration, but that, alone, has not made administration more efficient or effective. Spot virtualization – virtualized storage, virtualized ports on switches, and virtual machines have solved many problems of capacity and allocation, but they have not touched the challenge of getting work done. This has been a matter of assigning application workloads to physical servers, and monitoring both the physicality of the server and the logicality of the application. Levanta takes two huge steps to redraw the parameters of the getting-work-done scenario. Once this is done, other opportunities, including enhanced ways to use virtual machines, become possible. Let's start with the two big steps:

### Step 1:  Intrepid virtualizes the WHOLE Software Stack

The ability to virtualize the whole software stack – operating system, middleware, and application – is abetted by the architectural clarity of Linux. It might be possible with other *NIXes, but not with Windows.

Levanta's approach is to take all the data making up the stack and put it in a repository, either on its *Intrepid M* appliance, or on Networked-Attached storage (NAS) or, with the new *Intrepid X,* on a SAN (FC or iSCSI). The Intrepid M (for Management) was its original product, and still is ideal for laboratories and other environments with a localized computing focus. As more enterprises became used to networked storage, the virtues of stripping out the disk drive, a potential source of failure, led to the development of the diskless Intrepid X.

The appliance manages the operating system, and all the instances of it that are running throughout the enterprise. The physical servers have access to the stored software stack and think of it as their own – which it is, in a way. This brings us to Step 2.

### Step 2:  MapFS tracks the state of each deployed instance and save all changes with MapFS

The MapFS approach may remind you of what continuous data protection does in storage environments. All changes are saved atomically as files, and then applied to a base configuration to restore a file, or, in the Levanta

case, a server, a desired point in time. Servers can be rolled back.

This makes recovery and provisioning of

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### Levanta Appliances at a Glance

*Intrepid M*

- Intrepid M is a 2-U high turnkey appliance. Each appliance has a RAID controller and internal disks that hold Levanta's repository and overlay.
- Intrepid M can also be deployed with NAS storage, using an *OnStor NAS Gateway* or *Network Appliance* filer, if that is desired.
- *Price*:  $7,995 for the appliance and a $275 perpetual license for each connected server.
- A 40-server bundle costs $18,995 to buy.

*Intrepid X*

- Intrepid X is physically similar to Intrepid M, but has no internal storage, comes with an adjacent network power switch, and is designed to be connected to a SAN. The appliance is deployed in active-passive pairs that share all information and fail over automatically (though the management interface will need a reboot). Intrepid X comes with Fibre Channel Host Bus Adapters (HBAs) that are turned on with a separate license.
- Price: $17,495 for a pair of appliances, plus a $295 perpetual license for each server attached and a $5,995 license for Fibre Channel support.
- There is also an unlimited server license that is priced by I/O for both appliance models. When an unlimited license is useful is governed by the size and quality of the servers and storage and the nature of the I/O demands of the applications.
- Levanta Intrepid appliances support X86_64 (Intel and AMD) but not IA64. Levanta supports Red Hat Enterprise Linux (RHEL), SUSE Enterprise Linux Server (SLES), Fedora, Centos, and Asianux Linux distributions.

*Source:  Levanta*

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additional clones rapid. The provisioning need not be of the original configuration – it can also be of not of the state you need at the moment. This makes testing of applications, composite applications, application changes, and patches all easier. Because one can provision a bevy of servers for short-term test purposes, comprehensive testing is supportable, and the risk of change is sharply reduced.

Levanta stores both a read-only repository of original configurations, and an overlay repository of changes. When a change occurs, a copy-on-write process copies the original state to the read-only repository before the new state is written to the overlay. The frequency of the Checkpoints at which all changes are transferred to the repository can vary. Checkpoints can be invoked by the administrator, or can be set to occur with a regular frequency. By using the command line interface (CLI), agents and scripting, the administrator can also cause checkpoints to be evoked by specific kinds of events.

This creates a strong audit trail – an admirable resource for forensics and documentation for regulatory compliance. Because Levanta virtualizes the whole Linux stack, it will automatically capture the configuration and interdependencies of SOA, AJAX, and other aggregate elements.

## What Does This Do for the Enterprise?

For a CIO, disaster planning gets a lot easier. With documentation and strict change control, SOX, HIPPA, and other regulations can be faced with equanimity. eCommerce environments scale better. Those media distribution farms needed to support your video-filled websites and portals can deploy faster and scale farther. If you have labs, pesky configurations become a matter of record and easy to reproduce. If you have classrooms and other goof-prone environments, rollback is easy. If you do rendering or other big-data applications, the ability of Intrepid X to attach to SANs and Intrepid M to attach to big NAS, and the ability to scale out at will as the creative process demands makes satisfying the needs of your business users to get work done easy.

Then there's the whole virtual machine capability. The ability to recreate any particular instance so that additional hardware – in the

same *or a different location* – can point to it and begin functioning[1] is a great thing But you add in Levanta's ability to fully manage all virtual machines running Linux applications – anything with a PXE boot – including VMWare virtual machines – *and* including VMWare's VMotion – the virtual machines that can be sent from here to there while running an application – and all of a sudden you have a lot more ways to support the crazy things your business needs to do. Wouldn't you like to be able to face those demands, smile, and say *yes*?

## Conclusion

Looking back over decades, business has always been a not-necessarily-physical scale-out lifestyle, and enterprise computing has evolved in that model. Looking forward, that scale-out must be accompanied by some customization to meet the needs of customers. Levanta's transactional approach lets you do both without compromising either the quality of your systems or the satisfaction of your customers. This capability comes at just the right time for many enterprises. Is yours one of them?

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[1] Levanta's Director of Marketing David Dennis explains the difference with Change and Configuration Management Databases this way. CCMDBs use agents to track changes, report them, and map them to CIM-based models of devices. Whatever is outside the domain of the agent instrumentation of the CIM model does not get captured. MapFS, by its nature and the nature of Linux, captures it all.

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