

Open Source and the Virtualization Revolution

George Dunlap, PhD
Citrix Systems UK, LTD

Intro: Virtualization

- Virtualization is changing the computing landscape
- 30-year old technology just making it big
- For technology-oriented entrepreneurs:
 - Interesting case-study
 - New opportunities
- For business people
 - Solving your problems

Outline

- What is Virtualization?
- Applications, Obvious and Not
- Citrix, virtualization, and open-source

Who am I? (Why listen to me?)

- Senior software engineer at Citrix
 - PhD in CS from University of Michigan
 - Worked with virtual machines for over 10 years
- Technical expert, business amateur
- First-hand experience with Open-source virtualization economics

Entrepreneurship

- Connecting problems with solutions in a way that makes money
- People with problems don't know there can be a solution
- People with the solutions don't know that there's a problem

Virtualization

- Software ("Hypervisor") that makes one physical computer into several virtual computers
- Virtual cpus, memory, hard disk network card
- Separate operating system

Problem: Multiple OSes

- The Situation
 - You own a Mac
 - A program you need only runs on Windows
- Solution
 - Create a Virtual Machine on your Mac
 - Install Windows
 - Mac Primary, Windows available

Business consideration

- Definite value proposition
- Market?
 - People who need to straddle OSes
- Opportunity for capturing value?
 - Customer already paying for software

Problem: Server proliferation

- Businesses have many servers
 - E-mail, web, file, database
- Best practice: One machine per server
- Most servers are idle most of the time
 - Taking up space
 - Burning electricity
 - Generating heat

Solution: Server consolidation

- Buy one slightly larger computer
- Make several virtual computers from it
 - Each VM can have a different OS
 - Each VM can reboot / crash without affecting the others

But wait, there's more

- Flexibility in creating new servers
- Live migration
 - Moving a running VM from one server to another
 - Use: Hardware downtime
 - Use: Temporary spikes
- Complete hardware agnosticism
 - Cloud Computing

A growing market

- Estaticd 12% of servers virtualized in 2008
- Estimated 60% of servers virtualized by 2013
- Citrix XenServer / Xen Cloud Platform ecosystem

Desktop virtualization

- Desktops run in a corporate cloud
- Flexibility, management

Problem: Corporate laptops

- IT departments: Control
 - Ease of use
 - More importantly: Security
- Laptop users: Freedom
 - Games, skype, DVDs, &c
- Options
 - Carry two laptops?
 - Accept security risk

Solution: XenClient

- Personal VM
 - User installs whatever he wants
 - Direct access to video hardware
- Corporate VM
 - Locked down by IT
- Other advantages
 - Personal VM isolated f/ corporate network
 - Corporate VM automatically backed up
 - Migrating a XenDesktop VM

Citrix: Strategic Principles

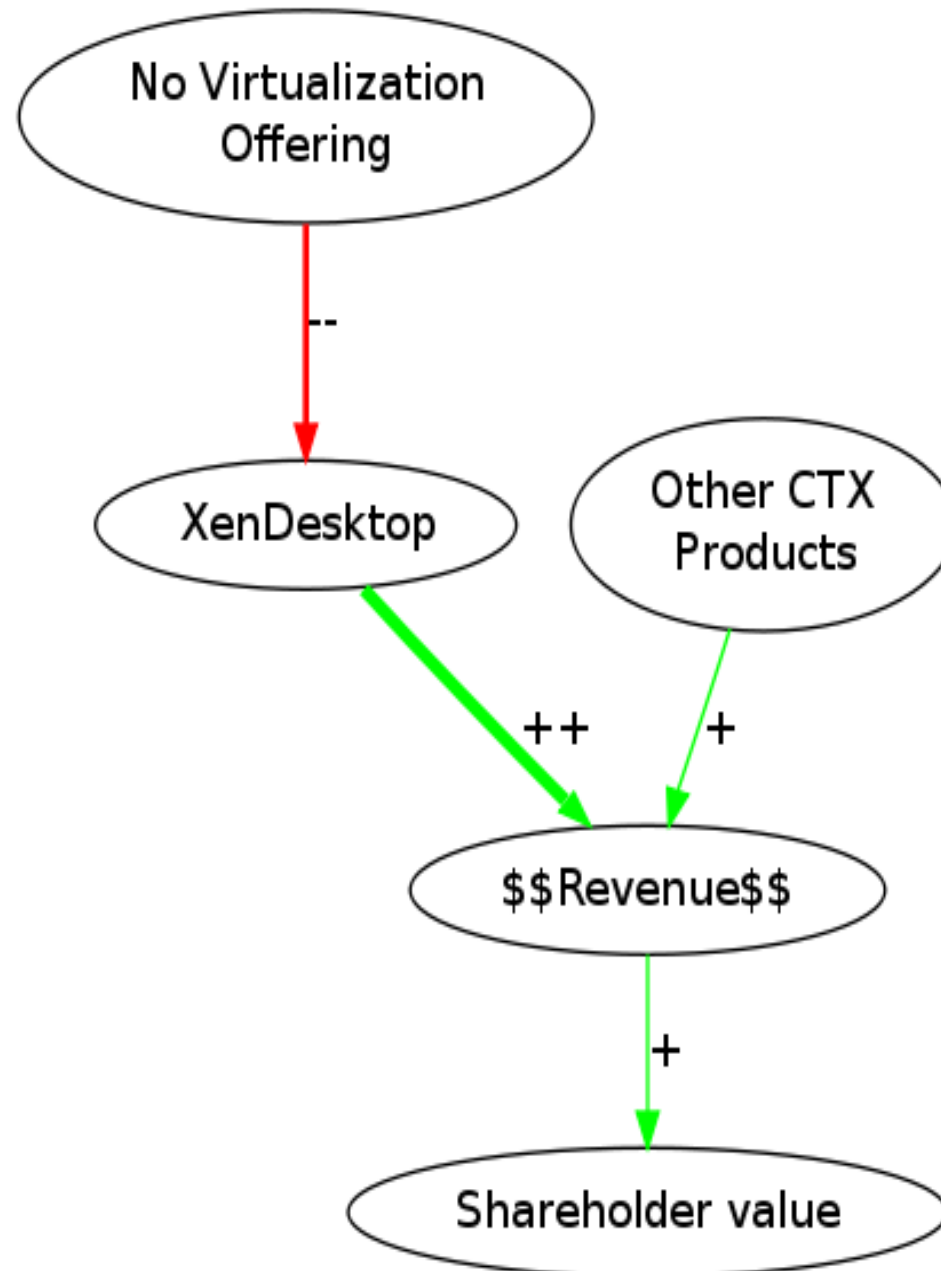
- Began with one product: XenApp
 - Remote application execution
- Barriers to growth: other applications
- Strategic principles
 - Acquire a portfolio of software which is mutually supportive, so that you can give a customer a complete solution.
 - Keep marketing each component separately

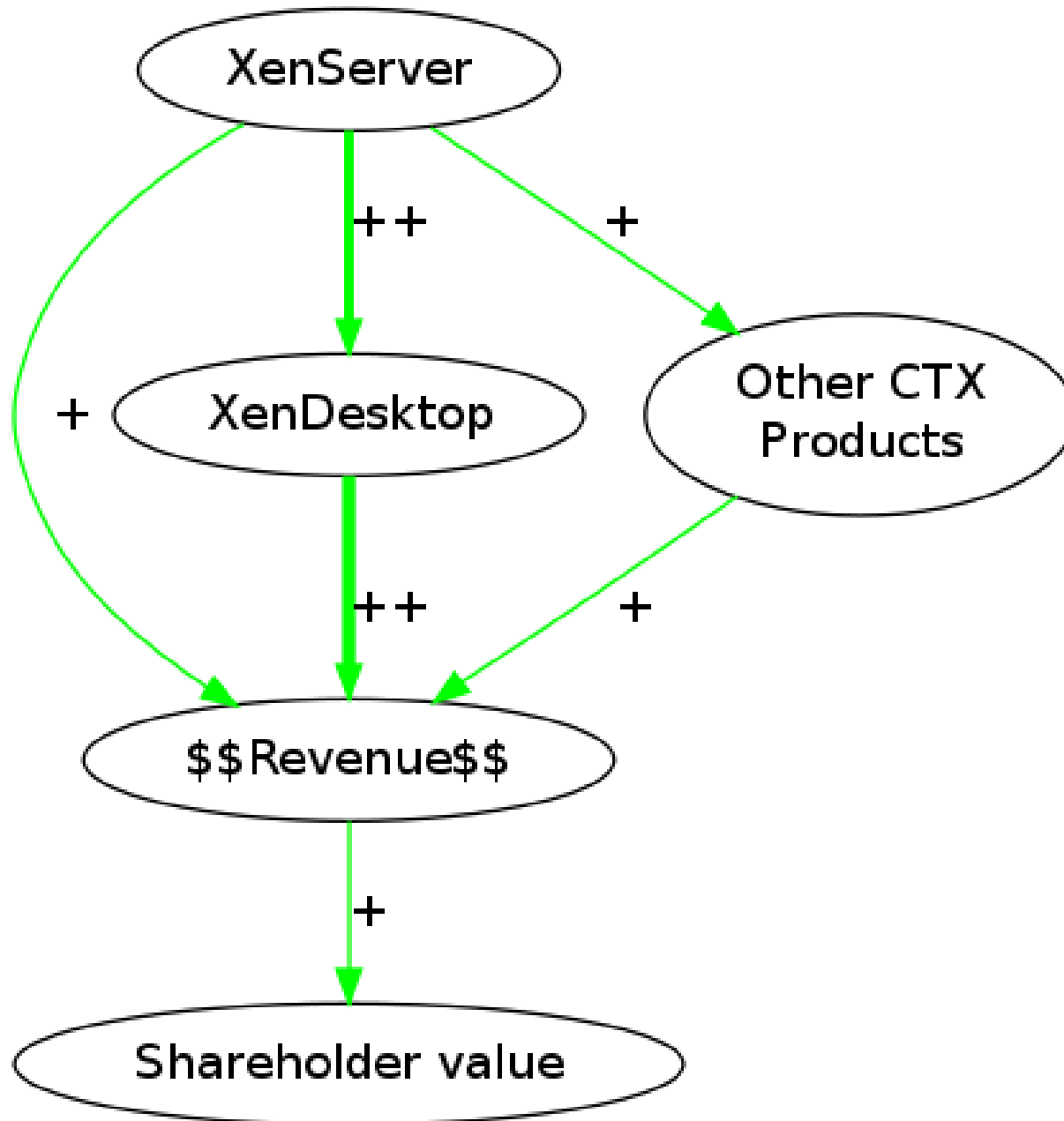
Example: NetScaler

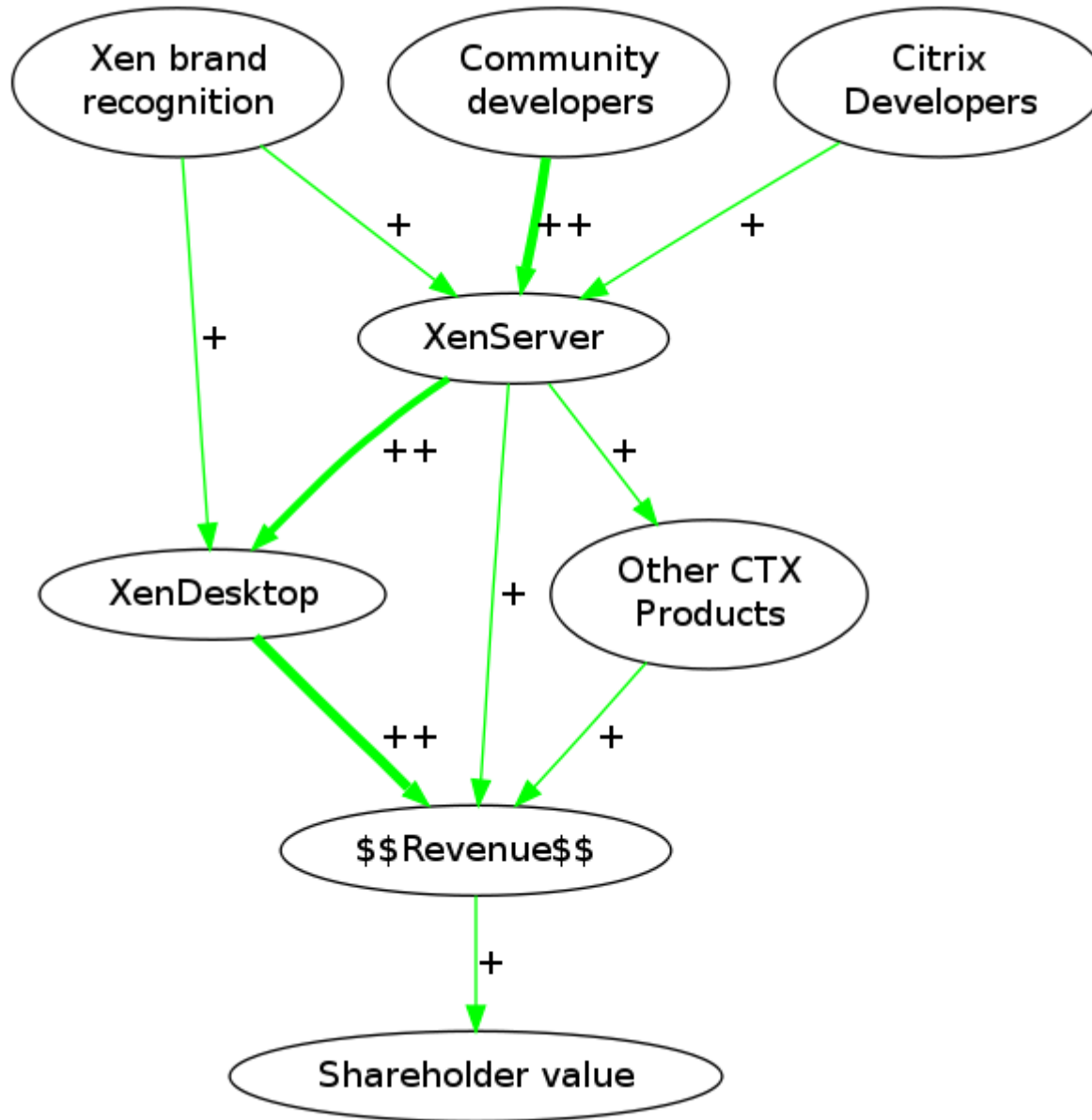
- XenApp over the internet
 - Traffic shaping
 - Load balancing
- Netscaler
 - Removes a barrier to growth
 - Still an excellent product on its own

Citrix and Xen

- Server virtualization alone?
 - Large, established competitor
 - Microsoft
 - Don't want to compete directly
- Virtual Desktop
 - New, wide-open market
 - Citrix core competencies
 - Remote display, computer image management, traffic shaping, user management
 - No hypervisor!

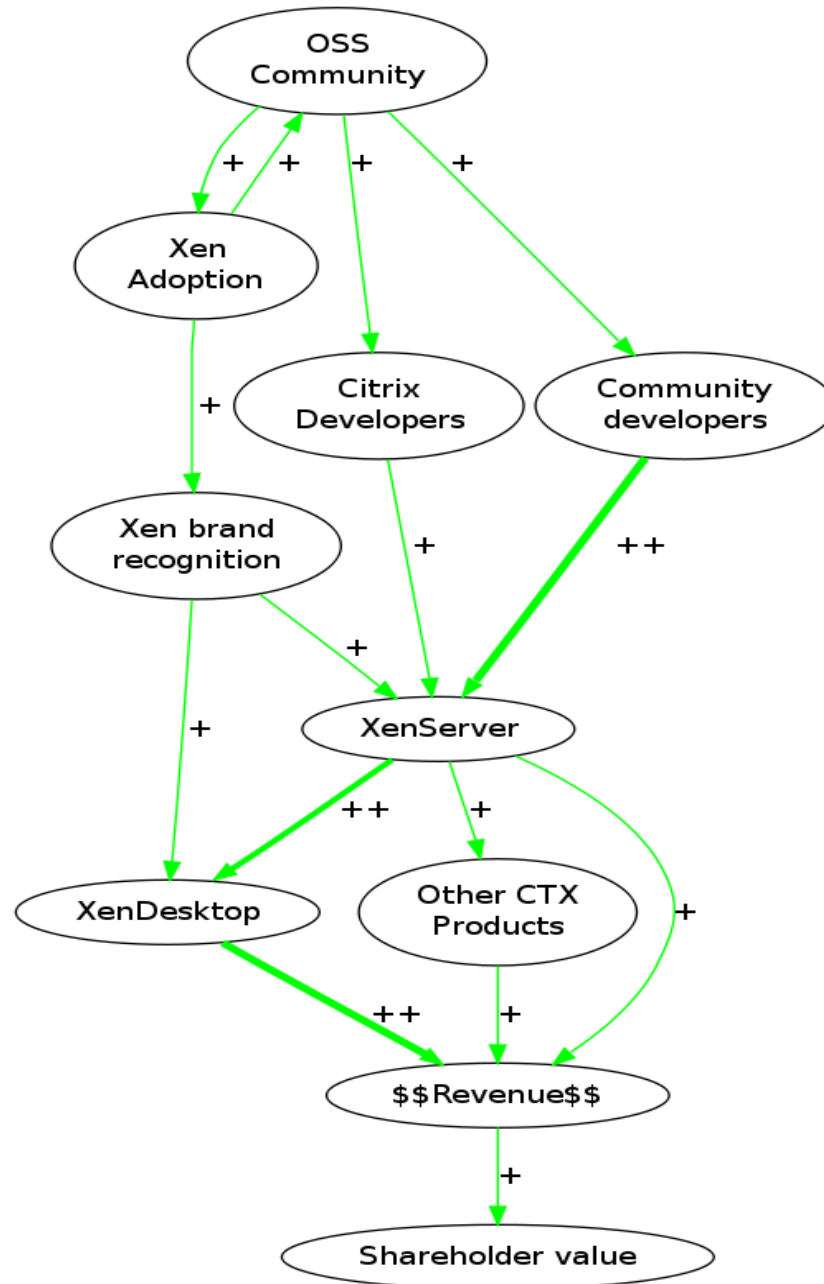


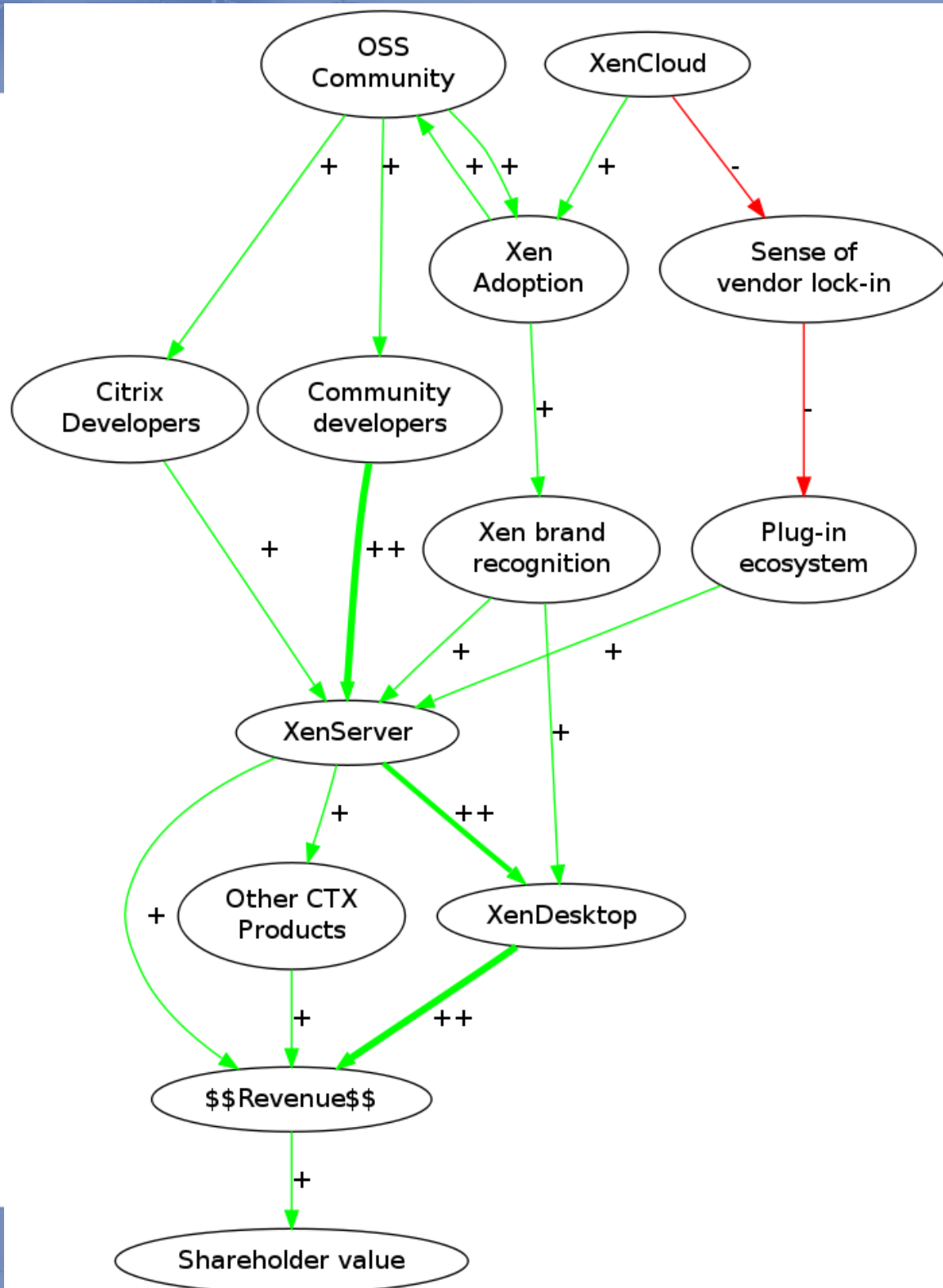




Community development

- Intel, AMD: Software using new hardware
- HP: A reason to buy top-tier hardware
- Fujitsu, Samsung, &c: Users
- Novell: Their own Xen offering
- Oracle: Ensuring performance of OracleDB
- Control your own destiny





Summary: Citrix and Xen

- XenDesktop
 - Key strategy for future growth
 - Citrix has lots of competencies
 - Needs a Citrix-branded hypervisor
- Other products benefit from Xen as well
 - Netscaler, PVS, &c
- Xen supports Citrix's strategic long-term goals

The Virtualization Revolution

- Opportunities for entrepreneurs
- Value for business people
- Xen open-source virtualization benefits everyone

Questions

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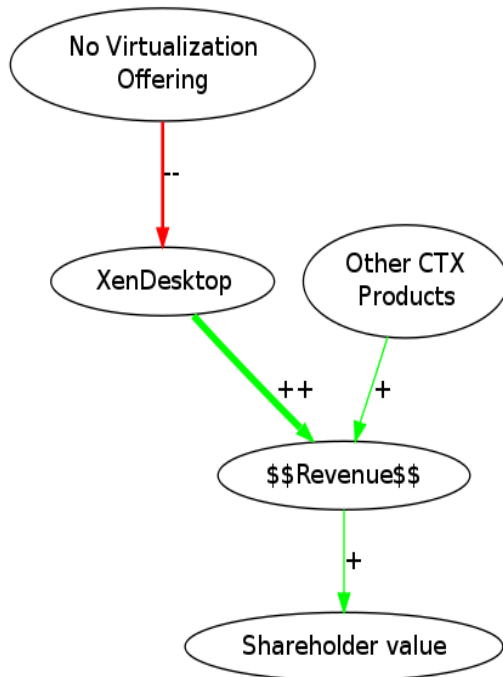
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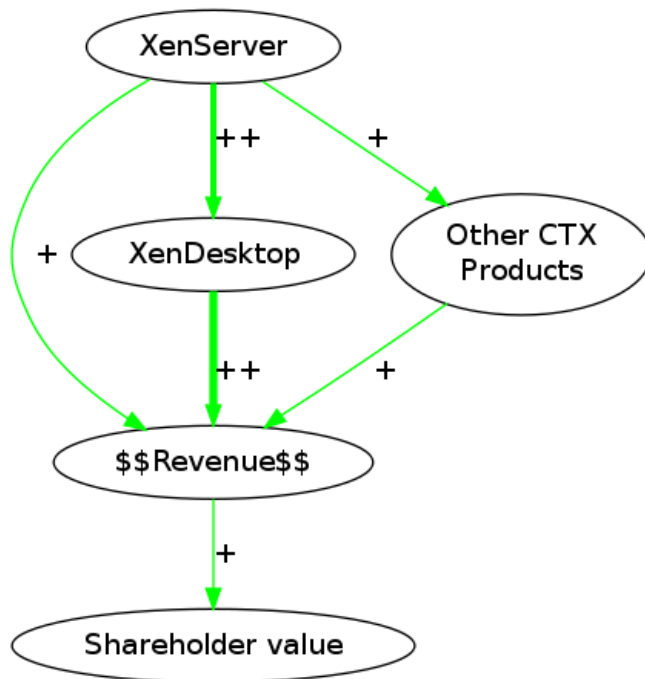
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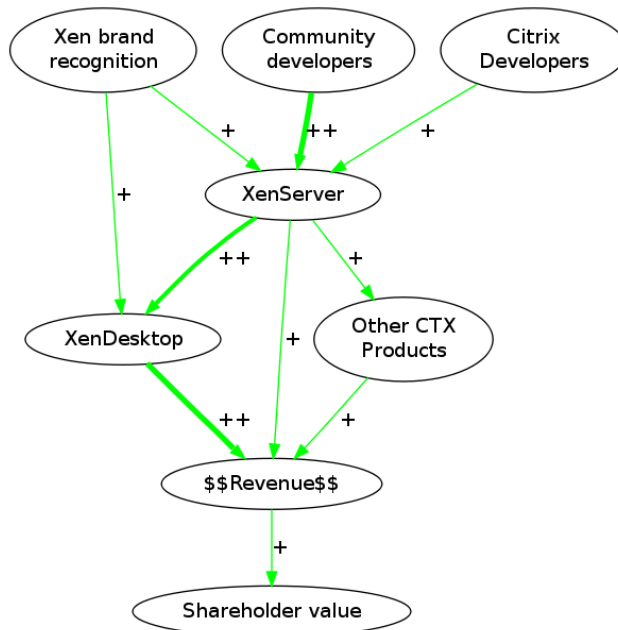
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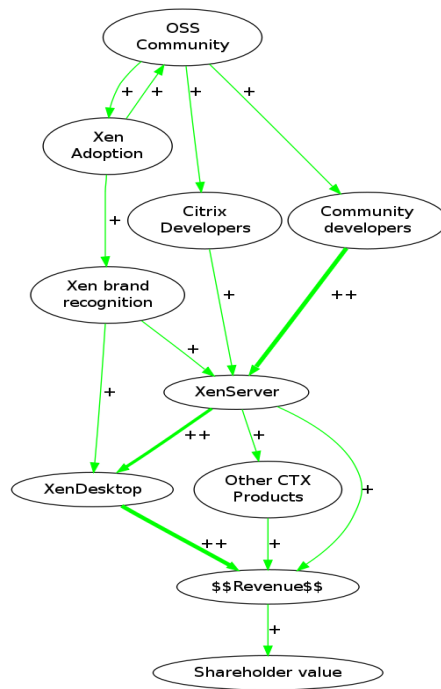


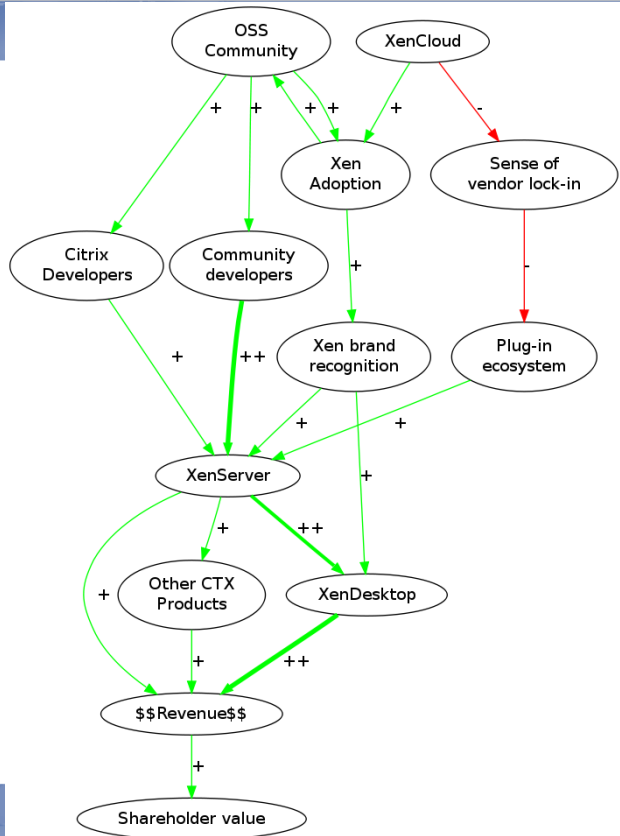




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