

Oct. 27 2021 Boston VMUG UserCon

The future of USB/SD in the vSphere Data Center and Home Lab



TinkerTry IT@home
Efficiency, virtualization, storage, backup and more

Paul Braren

TinkerTry.com/contact

vExpert 2014-2021

Veeam Vanguard 2015-2019

VCP # 2681 in 2005

Founder of TinkerTry.com, LLC

Advisory Solutions Engineer for New England, Enterprise at Dell Technologies

Today's presentation is available by
2:00 pm on Oct 27 2021 at:

bit.ly/bostonvmug2021

Also note that most images in this deck are hyperlinked to the original source.

Feedback always appreciated!

Public comments left below related TinkerTry.com
articles are preferred.

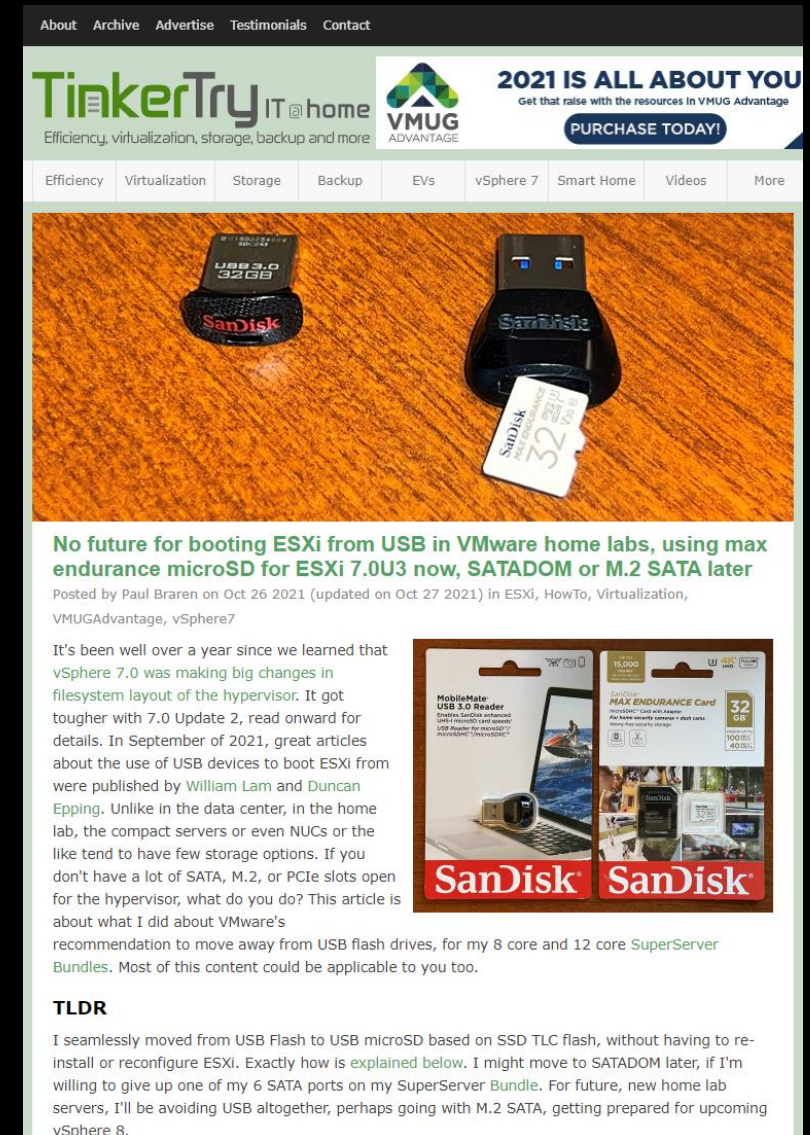
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Disclaimer

My presentation today is not associated with my employer, my day job. I'm attending this VMUG today as content creator at TinkerTry.com. All major product releases have issues, this presentation focuses on helpful, constructive, positive stories of success in hopes of helping others smooth out the inevitable rough edges they'll experience too. After lab testing, I'm much more familiar with the VMware vSphere 7.0 Update 3 that my customers will be putting into production.

Outline

- Background
 - Everything I plan to talk about today, including this slide deck, is published at [No future for booting ESXi from USB in VMware home labs, using max endurance microSD for ESXi 7.0U3 now, SATADOM or M.2 SATA later](#)
- The rest of this deck is reference material




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No future for booting ESXi from USB in VMware home labs, using max endurance microSD for ESXi 7.0U3 now, SATADOM or M.2 SATA later

Posted by Paul Braren on Oct 26 2021 (updated on Oct 27 2021) in ESXi, HowTo, Virtualization, VMUGAdvantage, vSphere7

It's been well over a year since we learned that vSphere 7.0 was making big changes in filesystem layout of the hypervisor. It got tougher with 7.0 Update 2, read onward for details. In September of 2021, great articles about the use of USB devices to boot ESXi from were published by William Lam and Duncan Epping. Unlike in the data center, in the home lab, the compact servers or even NUCs or the like tend to have few storage options. If you don't have a lot of SATA, M.2, or PCIe slots open for the hypervisor, what do you do? This article is about what I did about VMware's recommendation to move away from USB flash drives, for my 8 core and 12 core SuperServer Bundles. Most of this content could be applicable to you too.



TLDR

I seamlessly moved from USB Flash to USB microSD based on SSD TLC flash, without having to re-install or reconfigure ESXi. Exactly how is explained below. I might move to SATADOM later, if I'm willing to give up one of my 6 SATA ports on my SuperServer Bundle. For future, new home lab servers, I'll be avoiding USB altogether, perhaps going with M.2 SATA, getting prepared for upcoming vSphere 8.

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VMUG's Ready to Help You Build Your **Home Lab**

EVALExperience
by VMware

New in 2015 - VMUG Advantage now includes [VMware's EVALExperience](#), giving you exclusive access to nine VMware applications to test for 365 days.

My portable datacenter is identical to what I run at home



[The Xeon D Supermicro SuperServer "Bundle 2" of joy, a complete home datacenter virtualization solution that really flies](#)

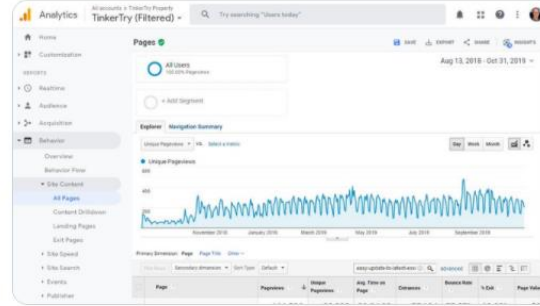
My Home Lab Workbench





Even if you're back-level, don't worry, got your back!

Paul Braren | TinkerTry.com @paulbraren · Oct 31, 2019
Oh gosh, no problem, glad [TinkerTry.com/easy-update-to...](#) helped! Just looked up the page stats, turns out it has passed 100,000 views, apparently there's a need, geez! Notice the new @VMUGAdvantage ad atop TinkerTry? I'm so thankful for their support, such a great match!



VMUG Advantage @VMUGAdv · Nov 1, 2019
Congrats on 100,000 views! We appreciate your support for the @MyVMUG community and #VMUGAdvantage!

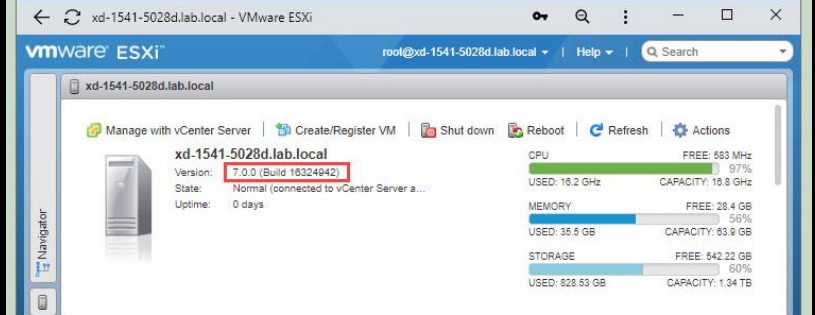
Paul Braren | TinkerTry.com @paulbraren
Replying to @VMUGAdv @jdw Wallace and 2 others

Wow @VMUGAdv, what an awesome surprise to have such great swag waiting for me at the post office today, THANK YOU for your support of the #vCommunity! Happy to wear it proudly, and glad to distribute those pamphlets at any VMUGs I attend!

[TinkerTry.com/vmug-advantage...](#)
[@MyVMUG #vExpert](#)



9:33 PM · Nov 21, 2019 · Twitter Web App



How to update any VMware ESXi Hypervisor to the latest using ESXCLI for easy download and install

Posted by Paul Braren on Aug 14 2018 (updated on Aug 17 2020) in ESXi, HowTo, HomeLab, Virtualization, vSphere7 78 Comments

The below list of one-liner SSH commands allow **all ESXi enthusiasts** to get to the very latest ESXi version (or any particular version) at any time. Seriously easy, much like apt get in Linux. Yes, even these folks:

- users of the **Free Hypervisor** (limited functionality)
- sysadmins for small labs with ESXi only and **no vCenter or VCSA**, thus, no VMware Update Manager (VUM), the preferred way to upgrade
- folks like me who have a VCSA appliance on the ESXi host we're trying to update but it won't let us proceed because we don't have DRS set to on for our small cluster (or single server)
- VMUG Advantage **EVAExperience Subscribers**, well worth every penny (full functionality, no need to rebuild, just re-up every year)



VMUG Advantage gives me value end-to-end. I was able to use EVAExperience licenses to build my home lab, got discounts on both training and certification, and used my VMUG Advantage discount for VMworld (the **only** discount that stacks!). As long as I'm using VMware products, I'll be upgrading to VMUG Advantage.

- VMUG Advantage Member

Let that sink in for a moment. It doesn't really matter that the Free Hypervisor and EVAExperience download sites aren't updated very often, you don't have to wait to get the latest version of the ESXi Hypervisor! For example, you can easily test the very latest Hypervisor-Specific Mitigations.

Warning!

Demo Time!

1. VMware vSphere Client showing VCSA 7.0U3a and ESXi 7.0U3
2. Show M.2 NVMe SSDs & datastores
3. Compare with USB datastores
4. Windows 11 VM

My work story

TinkerTry.com/about

My IT Career Timeline

Cornell University Help Desk

Mar 1993 - Jul 1994 - Worked for free that first week, on the promise of reducing PC (DOS/Windows) help ticket backlog. Did some development as we rapidly got students online in those very early days of explosive internet growth.



MindShare Associates

Sep 1994 - Oct 1997 - OS/2 Technical Consultant / Trainer
Got myself OS/2 Certified, earning myself a chance to train corporate resellers. I became the technical lead as we grew from 12 to 180 employees in a 6 month span, driving extensively because we couldn't afford to fly. Worked from 1995 to 1997 as a contractor at IBM Waltham Solution Partnership Center which became the IBM Innovation Center, training, and creating a new computing infrastructure and standing up all new datacenter equipment at a lovely customer-facing facility. Curator of the ThinkPad museum in the lobby too!



IBM

Oct 1997 - Dec 2016 - World Wide Technical Team Lead of IBM ServerProven Program, helping build then run the customer datacenter.



We helped customers speed up their application, and I helped automate the OS deployments for all those labs and classes. I then flew around for 5 years as a Lab Services Technical Consultant and Trainer, doing many rack-and-stacks and VMware JumpStart! deployment/trainings, deployed datacenter hardware and software in 35 of the 50 states in nearly all industry sectors, including Federal. My last 7 years at IBM as a Senior Storage Technical Advisor were focused on IBM XIV and FlashSystem Storage, performing and overseeing hundreds of successful installations of half-million dollar deployments. This role included customer risk-reduction through careful, proactive change management, along with emergency response management, yes, that meant I was on-call duty nearly 24x7, for 7 years!. I also did root-cause analysis after data available events. Gladly, of my dozens of customers, none experienced a data loss event.

I announced the end of my international adventures at IBM in my thank you article titled Thank you IBM, for 21 amazing years!.

VMware

Jan 2017 - Jun 2019 - VMware Systems Engineer (vSAN)



While airborne, I proudly announced Today is my first day at VMware!. I went in with my eyes wide open, knowing full well that such a career pivot to a pre-sales role would be rather new to me, as it was not the sort of role I had been in since the early 1990s. My title was Systems Engineer, reporting to incredibly well-liked Peter Keilty. I got to witness the team double in size several times, an awesome rocket-ship ride trajectory was a very good thing for employees. I was one of only 4 hired in the Commercial sector, covering a massive patch, from Michigan to Maine to Virginia!



Aug 2018 - VMware Senior Systems Engineer (vSAN). This was a promotion, and a relief. Perhaps I can do this job after all!

Feb 2018 - VMware Senior Solutions Engineer (HCI)

Promotion! Pared with my Account Executive, we beat all sales objectives and then some, and received team awards. By the end of the year, our territory had shrunk to New England and Metro New York City, which is perfect for where I live in Central Connecticut, right between Boston and New York! Driving now more than flying, but still helping with booth duty at industry events too, which I quite enjoy.



Feb 2019 - Even more hiring, wow! This is sales, where change is to be expected.



Pivot3

Jun 2019 - Advisory Systems Engineer / vArchitect

Details at Just started my next adventure in infrastructure IT at Pivot3 as a Solutions Architect!



Dell Technologies

Oct 2019 - Advisory vArchitect
Details at Today is my first day at Dell Technologies as an Advisory vArchitect!



Twitter

[@paulbraren](https://twitter.com/paulbraren)

The screenshot shows the Twitter profile of Paul Braren. At the top, there is a navigation bar with a back arrow, the name "Paul Braren | TinkerTry.com", and icons for a laptop, a plug, a plus sign, and a car. Below this, it says "6,750 Tweets". The main content area features a large preview of the TinkerTry website. The website header includes "TinkerTry IT@home" with the tagline "Efficient virtualization, storage, backup and more". There are navigation links for "About", "Technicians", "Advertise", and "Contact". A "Free Study Guide" button is visible. The main article on the website is titled "Announcing the Intel® Xeon® Processor D-1500 Utilizing 20 Years of Data Center Experience". A circular profile picture of Paul Braren is shown on the left. To the right of the profile picture is an "Edit profile" button. Below the profile picture, the name "Paul Braren | TinkerTry.com" and handle "@paulbraren" are displayed, along with the same set of icons as in the top bar. The bio reads: "Dad. Dell SE, worked at VMware & IBM too. vExpert. All views my own. All EV home. TinkerTry IT @ home - efficient virtualization, storage, backup, & more." At the bottom, it shows the location "Wethersfield, Connecticut", the website "TinkerTry.com", and "Joined May 2008".

October 2015 – July of 2021

Well over 1,000 folks bought Bundles from Wiredzone, with less than a 0.5% return rate.

Ready for VMware ESXi 6 / Microsoft Windows 10 / Windows Server / Hyper-V!



Supermicro Mini Tower Intel Xeon D-1540 Bundle 2

SKU: 10024470B2
MFG Part Number: SYS-5028D-TN4T-BUNDLE2
In stock

(write a review)

- 64GB DDR4 2133MHz RDIMM ECC Memory
- Assembly and Testing Included

Bonus Items

- SanDisk Ultra Fit CZ43 32GB USB 3.0 Flash Drive
- Internal System Speaker
- 6th SATA3 Supermicro Cable
- TinkerTry Stickers






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TinkerTry'd Home Datacenter

Powerful, quiet, compact, efficient solution bundles.



- Intel Xeon D-1541 or Intel Xeon D-1567 14nm SoC (System on a Chip)
8 or 12 cores (vs. Skylake's 4)
6 2x/3x more L3 cache, up to:
 - ◊ 128GB DDR4 RAM (4x32GB 2400MHz), 64GB included (2x32GB)
 - ◊ 6 SATA3 drive bays (2 int. 2.5" + 4 3.5" hot-swap (2.5" opt.))
 - ◊ 1 NVMe drive slot (PCIe 3.0x4/M.2/U.2) for fastest SSD., opt. 2nd M.2 adapter, 3,500/2,700 MB/sec read/write! (~6x SATA3)
- 4 RJ45 NICs – 2 Intel X557 10GbE + 2 Intel I-350 1GbE
- 1 RJ45 1GbE for IPMI mgmt./iKVM Console Redirection w/ HTML5
- Supermicro SuperServer SYS-5028D-TN4T w/ ESXi 6.7 is easy, and is the only mini-tower on the **VMware Compatibility Guide**, not Intel NUC, HPE Gen8/9 MicroServer, Apple Mac mini, ASUS, ASRock Rack, or GIGABYTE Server
- VMware vSphere 6.0/6.5/6.7, Win 10/Server 2012/16/19/Hyper-V, RHEL, SuSE, Nutanix CE/Acropolis, FreeNAS, or XenServer
- Details and reseller's prices at TinkerTry.com/superservers



Announcing the Intel® Xeon® Processor D-1500
Utilizing 20 Years of Data Center Experience

IN PRODUCTION

Intelligent
Xeon performance and features
RAS, Intel® Virtualization Tech,
Platform Storage Extensions, Intel® AES-NI

Dense
Integrated Intel® Ethernet & I/Os
~20 - 45 W

Agile
IA Software Compatible
Software scalability across platforms

System on a Chip (SoC)
Intel 14nm process technology

[TinkerTry'd Supermicro SuperServer Bundle - powerful and efficient home virtualization lab solutions](#)

Around back

- Two USB 3.0 ports



Support Challenges & Mythbusting

The VMUG Advantage EVAExperience and the VMware vExpert programs do not include any VMware vSphere support, and are intended for non-production workloads.

While Xeon D-1500 CPUs are on the VMware Compatibility Guide (VCG), VMware support goes by your system model, e.g. Supermicro SuperServer SYS-5028D-TN4T.

I paid ~\$576 for [vSphere Essentials](#), as I run some “production” VMs and I need to know what my readership experiences.

I paid \$308 for [Per Incident Support - vSphere Essentials](#).

I tried opening a ticket in mid-April, and failed to get an SR# assigned due to my system [SYS-5028D-TN4T](#) not being on the VCG for ESXi 7.0U1.

This has since been resolved, it's [on the VCG for ESXi up through 7.0U3!](#)

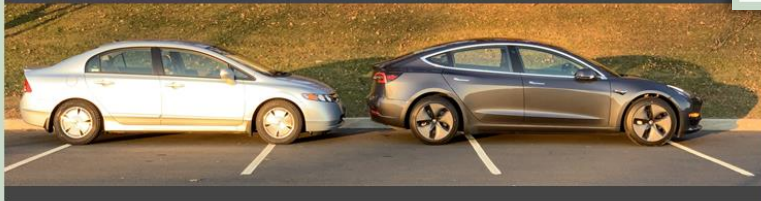
How do you do bug reports for complex issues when you can't even open a ticket?

In case you're interested

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Efficiency Virtualization Storage Backup Smart Home Tesla vSphere 7 Videos

2006 Honda Civic Hybrid | 2018 Tesla Model 3 LR AWD



Tesla Model 3 replacing my 13 year old Honda Civic Hybrid, let's see how that goes. So far, so good!

Posted by Paul Braren on Dec 23 2018 (updated on May 12 2020) in Efficiency, IoT, Tesla 12 Comments

At the start of this video this video, Roadshow's Tim Stevens proclaims:

What you're looking at is the most anticipated car of all time. With more than a half million pre-orders on the books, the Tesla Model 3 has piqued the interest of more people around the world than any car in history.



See also these lofty claims:

- **Tesla Model 3 = Most Efficient Electric Car On Highways**
Aug 19 2018 by Dr. Maximilian Holland at CleanTechnica

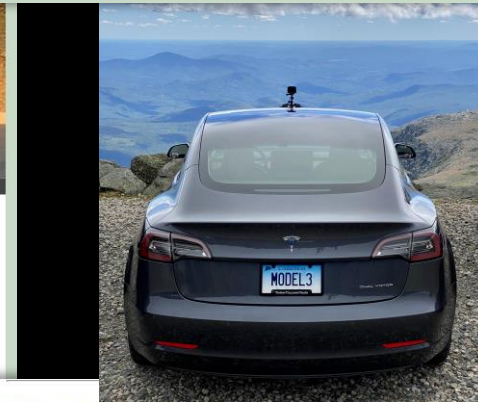
New aggregated data from the gurus over at A Better Route Planner show that Tesla Model 3 efficiency is the highest of any production car at highway speeds, with

First year and 25,000 miles of Tesla Model 3 ownership went very well, far exceeding our expectations
It's going well! So well that my wife and I carefully decided to do this last week: Tesla Tuesday for my wife, getting rid of our last gas car ever, a 2005 Honda Civic Dec 16 2019 We

Dec 23 2019 [Read →](#)

Tesla Tuesday for my wife, getting rid of our last gas car ever, a 2005 Honda Civic
Ready for departure! We both went for even more efficient cars than we already had, and let's be real, those Civics were more like 30 mpg and 25 mpg in the winter. Free Supercharging: If you find this article of value and decide to order a Tesla,

Dec 16 2019 4 Comments [Read →](#)



More videos

This first video gives you a tour of my garage's two overhead charging configurations, and the second video is a close look at the handy bracket and cable loop hanger.



TinkerTry YouTube Channel - Affordable and convenient way to get Tesla cables off garage floor, trip-free charging from above!

TinkerTryd Model 3 LR AWD Is Idling
1 Hour 7 Minutes

Charger Connected
90 / 90 %

Rated Range
274.89 Miles

Estimated Range
263.56 Miles

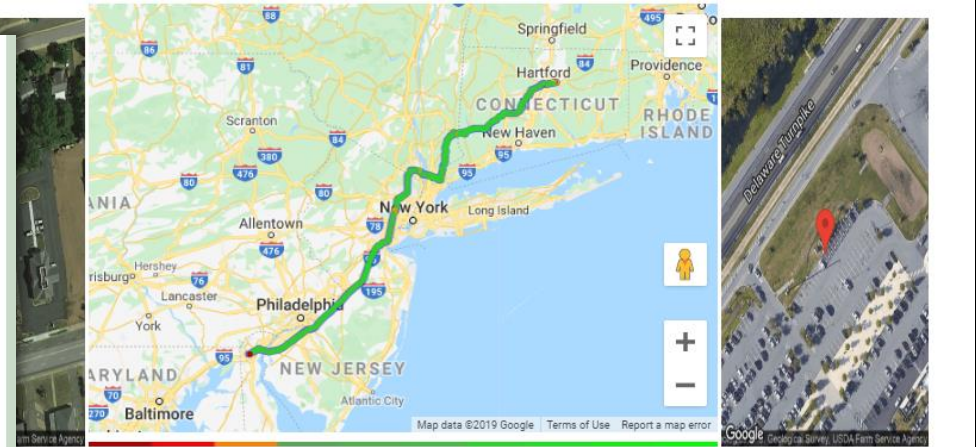
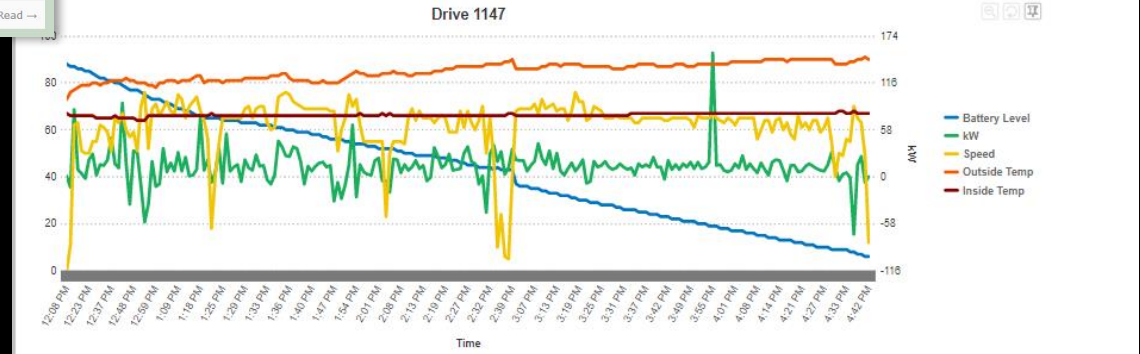
Inside Temp 56 F
Outside Temp 52 F

Doors Locked

Odometer
24,780.52 Miles

Drives Charges Calendar Controls Fleet Help Logout

Starting Address	Ending Address	Driving Time	Miles	Wh/Mile	Battery Usage	Cost	Elevation / Speed	Avg Temp	Drive 1147
307 Middle Turnpike West, Manchester Connecticut 06042, United States	1295 Newark, Delaware 19713, United States	4 Hours 34 Minutes 12:08 PM - 4:42 PM Data Accuracy 92%	273.44 Miles Driven 253.71 Rated Miles Used ODO 17 914.66 - 18,188.10	207 Wh/Mile 107.8% Efficiency	82% 56.54 kWh	Cost \$ 10.18 Gas Savings \$ 27.16	-99.1 ft Avg Speed 62 MPH Max Speed MPH	Outside 85 F Inside 66.3 F Fan Avg 5	



TinkerTry.com/EVs