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**Ethereum**, also known as **The Ethereum Project**, is a publicly available decentralized platform, built using the [blockchain](/wiki/Block_chain_(database)) technology, featuring [programmable transaction](/wiki/Smart_contract) functionality.[[1]](#cite_note-1)[[2]](#cite_note-2) It provides a decentralized [virtual machine](/wiki/Virtual_machine), the Ethereum Virtual Machine (EVM), that can execute peer-to-peer contracts using a [cryptocurrency](/wiki/Cryptocurrency) called *ether* (Ξ). Ethereum was initially proposed by [Vitalik Buterin](/wiki/Vitalik_Buterin), a cryptocurrency researcher and programmer, in late 2013 and in 2014 he described it as "[..] a next-generation cryptocurrency and decentralized application platform".[[3]](#cite_note-3) Development was funded by an online crowd sale during July-August 2014, with the participants exchanging bitcoins with the newly created ether tokens.<ref name=forbes20160423/> The total amount raised by the closure of the event at September 2nd, 2014 was $18,439,086. The Ethereum platform was officially launched at July 30th, 2015,[[4]](#cite_note-4) and a Swiss non-profit foundation, the Ethereum Foundation.<ref name=forbes20160423/>

By May 2016, the [market capitalization](/wiki/Market_capitalization) of the cryptocurrency ether was more than [Template:Usd](/wiki/Template:Usd) and [Vox](/wiki/Vox_(website)) noted that the relatively new digital currency was challenging bitcoin by offering a range of services that are not possible using bitcoin.<ref name=vox20160524> [Template:Cite news](/wiki/Template:Cite_news)</ref>

On June 17, 2016 [The DAO](/wiki/The_DAO_(organization)), which had been hailed as a revolutionary use of Ethereum that demonstrated the potential for the platform, was hacked and around a third of the ether held by The DAO, worth about $50 million at the time, was moved.[[12]](#cite_note-12)[[13]](#cite_note-13) The thief transferred the ether into a clone of The DAO that probably prevented the hacker from withdrawing the ether for about a month.<ref name=Wired10160618>Klint Finley for Wired. June 18, 2016 [A $50 Million Hack Just Showed That The Dao Was All Too Human](http://www.wired.com/2016/06/50-million-hack-just-showed-dao-human/)</ref> After the hack the Ethereum community debated how and whether to reclaim the ether crypto currency that was taken, and whether to shut down The DAO.<ref name=Wired10160618/> The decentralised nature of the DAO and of Ethereum and digital currencies more generally means 'there is no central authority that can simply flip a switch and make changes. Decisions have to be reached by community consensus.'[[14]](#cite_note-14)

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## Ether[[edit](/index.php?title=(none)&action=edit&section=2)]

[Template:Main](/wiki/Template:Main) [Template:Infobox currency](/wiki/Template:Infobox_currency) The value token of the Ethereum blockchain is called ether. Ether is also used to pay for transaction fees and computational services on the Ethereum network.<ref name=NYTvirtual/>

It is traded on [cryptocurrency](/wiki/Cryptocurrency) exchanges like any other cryptocurrency;[[15]](#cite_note-15) Buterin sold 25% of his ETH holding in April 2016,[[16]](#cite_note-16) describing this diversification as "sound financial planning," and also stated in response to critics that he doesn’t share religious fanaticism about Ethereum, which he had always been stressing publicly, saying 'there always is a chance that the project would eventually fail'. Buterin also quoted [Gavin Andresen](/wiki/Gavin_Andresen)’s statement concerning Bitcoin: “I still say that it’s an experiment, and the whole thing could implode.” [[17]](#cite_note-17) The price can be volatile per circumstances, such as a plunge from $21.50 to $15 when The DAO was hacked on June 17, 2016.[[13]](#cite_note-13)

## Smart contracts[[edit](/index.php?title=(none)&action=edit&section=3)]

[Template:Main](/wiki/Template:Main) [Smart contracts](/wiki/Smart_contract) are applications with a state stored in the blockchain. They can facilitate, verify, or enforce the negotiation or performance of a contract, or that make a contractual clause unnecessary. Ethereum contracts can be implemented in various [Turing complete](/wiki/Turing_complete) scripting languages,[[18]](#cite_note-18)The Ethereum system has been described by the [New York Times](/wiki/New_York_Times) as "a single shared computer that is run by the network of users and on which resources are parceled out and paid for by Ether."<ref name=NYTvirtual/><ref name=theEconomist20151031> [Template:Cite news](/wiki/Template:Cite_news)</ref>

Smart contracts on a public blockchain mean that bugs, including security holes, are visible to all but cannot be fixed quickly;<ref name=Peck20160528>[Template:Cite web](/wiki/Template:Cite_web)</ref> the 17 June 2016 attack on The DAO was of this sort and could not be quickly stopped.[[12]](#cite_note-12)

### Programming languages[[edit](/index.php?title=(none)&action=edit&section=4)]

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The Ethereum Virtual Machine (EVM) works on a protocol defined in the Ethereum Yellow paper. [Solidity](/wiki/Solidity) is the [JavaScript](/wiki/JavaScript)-like programming language designed for developing smart contracts that run on the Ethereum Virtual Machine (EVM). Solidity is compiled to bytecode which is executable on the EVM. Using Solidity, developers can write applications that implement self-enforcing business logic embodied in smart contracts.[[19]](#cite_note-19) Enterprise software vendors such as [Microsoft](/wiki/Microsoft) and [ConsenSys](/wiki/ConsenSys) have also created systems that translate common programming languages such as Visual Basic into Solidity coded smart contracts.[[19]](#cite_note-19)

### Performance[[edit](/index.php?title=(none)&action=edit&section=5)]

In Ethereum all smart contracts are stored publicly on every node of the blockchain, which has trade-offs.[[20]](#cite_note-20) The downside is that performance issues arise in that every node is calculating all the smart contracts in real time, resulting in slower speeds.[[20]](#cite_note-20) Ethereum engineers have been working on [sharding](/wiki/Shard_(database_architecture)) the calculations, but no solution is present at this time.[[20]](#cite_note-20) As of January 2016, the Ethereum protocol can process 25 transactions per second.[[20]](#cite_note-20)[Template:Update after](/wiki/Template:Update_after)

## Uses[[edit](/index.php?title=(none)&action=edit&section=6)]

As well as being a cryptocurrency, the Ethereum platform has multiple uses. By March 2016, companies developing for the Ethereum distributed application platform included [Microsoft](/wiki/Microsoft), [IBM](/wiki/IBM), and [JPMorgan Chase](/wiki/JPMorgan_Chase).<ref name=NYTvirtual/>

In hypothetical uses, higher-level software could utilize Ethereum to establish an online marketplace platform.<ref name=forbes20160423/> or in devices that have their permitted uses embedded in them, *e.g.* in car hire.[[21]](#cite_note-21)

### Applications[[edit](/index.php?title=(none)&action=edit&section=7)]

Ethereum has been used as a platform for decentralized applications, [decentralized autonomous organizations](/wiki/Decentralized_autonomous_organization) and smart contracts.<ref name=NYTvirtual/> <ref name=ibt20160120> [Template:Cite news](/wiki/Template:Cite_news)</ref> The scope of applications include projects related to finance, the [internet-of-things](/wiki/Internet_of_Things), identity management,[[22]](#cite_note-22) [farm-to-table](/wiki/Farm-to-table) produce, [electricity sourcing and pricing](/wiki/Smart_grid), and [sports betting](/wiki/Sports_betting).<ref name=NYTvirtual/> Decentralized autonomous organizations may enable a wide range of possible business models that were previously impossible or too costly to run.[[23]](#cite_note-23) Notable Ethereum applications include:

* [Augur](/wiki/Augur_(software)) decentralized, distributed [prediction market](/wiki/Prediction_market) software.[[24]](#cite_note-24)\* [ConsenSys](/wiki/ConsenSys), a blockchain startup focused on Ethereum technology is developing both enterprise software and Dapps.[[25]](#cite_note-25)\* [The DAO](/wiki/The_DAO_(organization))[[26]](#cite_note-26) with the objective to "provide a new decentralized business model for organizing both commercial and non-profit enterprises".<ref name=ibt20160430>

[Template:Cite news](/wiki/Template:Cite_news)</ref><ref name=wsj20160516>[Template:Cite news](/wiki/Template:Cite_news)</ref> The DAO was funded with Ether.<ref name=ibt20160430/><ref name=NYTvirtual>Nathaniel Popper for the New York Times. March 27, 2016 [Ethereum, a Virtual Currency, Enables Transactions That Rival Bitcoin’s](http://www.nytimes.com/2016/03/28/business/dealbook/ethereum-a-virtual-currency-enables-transactions-that-rival-bitcoins.html?_r=0)</ref>

* Backfeed, socioeconomic platform[[27]](#cite_note-27)\* Ethcore, an Ethereum-based private venture focusing on light clients and [Internet of Things](/wiki/Internet_of_Things) (IoT).[[28]](#cite_note-28)\* FreeMyVunk, a gaming value platform.[[29]](#cite_note-29)\* The Rudimental, an equity crowdfunding portal for arts and media.[[30]](#cite_note-30)\* TransActive Grid[[31]](#cite_note-31)\* Slock.It, a system for building smart locks with Ethereum.[[32]](#cite_note-32)\* Etheropt, a decentralized options exchange.[[33]](#cite_note-33)\* Digix<ref name=forbes20160423>[Template:Cite news](/wiki/Template:Cite_news)</ref> A value token, called DigixDAO has also been created and the token began trading on exchanges on 28 April 2016.[[34]](#cite_note-34)[[35]](#cite_note-35)\* Ujo Music.[[36]](#cite_note-36) [Imogen Heap](/wiki/Imogen_Heap) used the technology with her single "Tiny Human".[[36]](#cite_note-36)

### Enterprise software[[edit](/index.php?title=(none)&action=edit&section=8)]

Ethereum is also being either tested or implemented by [enterprise software](/wiki/Enterprise_software) companies for various applications.

* [Deloitte](/wiki/Deloitte) and [ConsenSys](/wiki/ConsenSys) announced plans in 2016 to create a digital bank called Project ConsenSys.[[37]](#cite_note-37)\* R3 Project, which connects 11 banks to distributed ledger using a private Ethereum blockchain running on [Microsoft Azure](/wiki/Microsoft_Azure).<ref name=ibt20160120/>
* IBM ADEPT, an IoT system using Ethereum for smart contracts support.[[38]](#cite_note-38)\* [Microsoft Visual Studio](/wiki/Microsoft_Visual_Studio) is making the Ethereum Solidity language available to application developers.[[39]](#cite_note-39)\*Ethereum Blockchain As a Service (EBaaS) on Microsoft Azure, which provides enterprise clients and developers with a cloud-based blockchain developer environment.[[25]](#cite_note-25)\*[Innovate UK](/wiki/Innovate_UK) provided 248,000GBP in funding to Tramonex to develop cross border payments prototype using Ethereum.[[40]](#cite_note-40)[[41]](#cite_note-41)

## Adoption[[edit](/index.php?title=(none)&action=edit&section=9)]

The [*New York Times*](/wiki/New_York_Times) noted in March 2016 that Ethereum platform adoption is still early, and that Ethereum could encounter technical and legal problems going forward that would slow the growth of the distributed computing platform. Many Bitcoin advocates say that Ethereum may "face more security problems than Bitcoin because of the greater complexity of the software."<ref name=NYTvirtual/>

A *New York Times* article said, "The system is complicated enough that even people who know it well have trouble describing it in plain English".<ref name=NYTvirtual/>

[Microsoft](/wiki/Microsoft) announced a partnership with [ConsenSys](/wiki/ConsenSys), a blockchain startup focused on Ethereum technology. Customers of popular cloud-based business service [Microsoft Azure](/wiki/Microsoft_Azure) have access to tools that "allow them to experience and build with cloud-based blockchain applications, from securities trading to cross-border payments...".[[2]](#cite_note-2)

## References[[edit](/index.php?title=(none)&action=edit&section=10)]

[Template:Reflist](/wiki/Template:Reflist)

## External links[[edit](/index.php?title=(none)&action=edit&section=11)]

* [Template:Official website](/wiki/Template:Official_website)
* [Ethereum Yellow Paper](http://gavwood.com/paper.pdf) by Gavin Wood
* [Ethereum White Paper](https://github.com/ethereum/wiki/wiki/White-Paper) by Vitalik Buterin

[Template:Cryptocurrencies](/wiki/Template:Cryptocurrencies)

[Category:Cross-platform software](/wiki/Category:Cross-platform_software) [Category:Cryptocurrencies](/wiki/Category:Cryptocurrencies)