Building the Blockchain

Dan Appleman

@danappleman   advancedapex.com
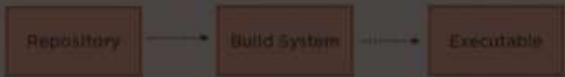
Prerequisites

Admins: Familiarity with declarative development on the Salesforce platform

Coders: Familiarity with software development on the Salesforce platform

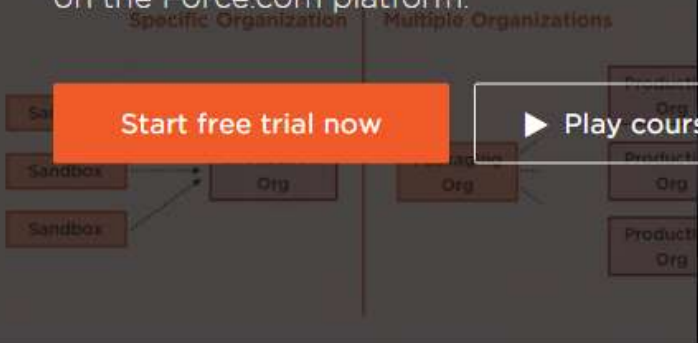**In other words – this is not a beginner's developer course!**

Secure | https://www.pluralsight.com/courses/forcedotcom-apex-for-developers

PLURALSIGHT | COURSES ⌄ | 🔍 What do you want to learn? | Get started | Log in

Traditional Build Process

Repository → Build System → Executable

Force.com and Apex Fundamentals for Developers

★★★★☆ By Dan Appleman

The opportunities for developers on the Force.com platform today are great, especially for experienced software developers. This course will help you quickly transfer your existing skills to building Apex applications on the Force.com platform.

Specific Organization | Multiple Organizations

Sandbox | Org | Org
Sandbox | Org | Org
Sandbox | Product Org

Start free trial now | ▶ Play course overview

Course Overview	1m 35s ⌃
Course Overview	1m 35s
The Deceptive Nature of Apex	8m 47s ⌃
🔒 Welcome	1m 56s
🔒 What Experts Know	6m 50s
Building Software on the Salesforce Platform	1h 0m ⌄
The Four Things Every Apex Developer Must Know to Avoid Failure	1h 16m ⌄
Surveying Apex Syntax: It May Look like Java or C#, but It's Not	36m 2s ⌄
Exploring the Salesforce Platform Class Library and Platform Features	42m 45s ⌄

A Bit of Architecture

Requirements for Inserting Blocks

Insertion by authorized trusted sources

Stored as a record in a Salesforce custom object

All hash fields must be valid for new blocks

There Are Many Ways to Insert Records

Insertion Method	Respects Security?
User interface	
Declarative	
Data APIs	
Data tools	
Apex	

There Are Many Ways to Insert Records

Insertion Method	Respects Security?
User interface	Yes
Declarative	Yes
Data APIs	Yes
Data tools	Yes
Apex	Optional

Option #1 – Add Blocks Using Code
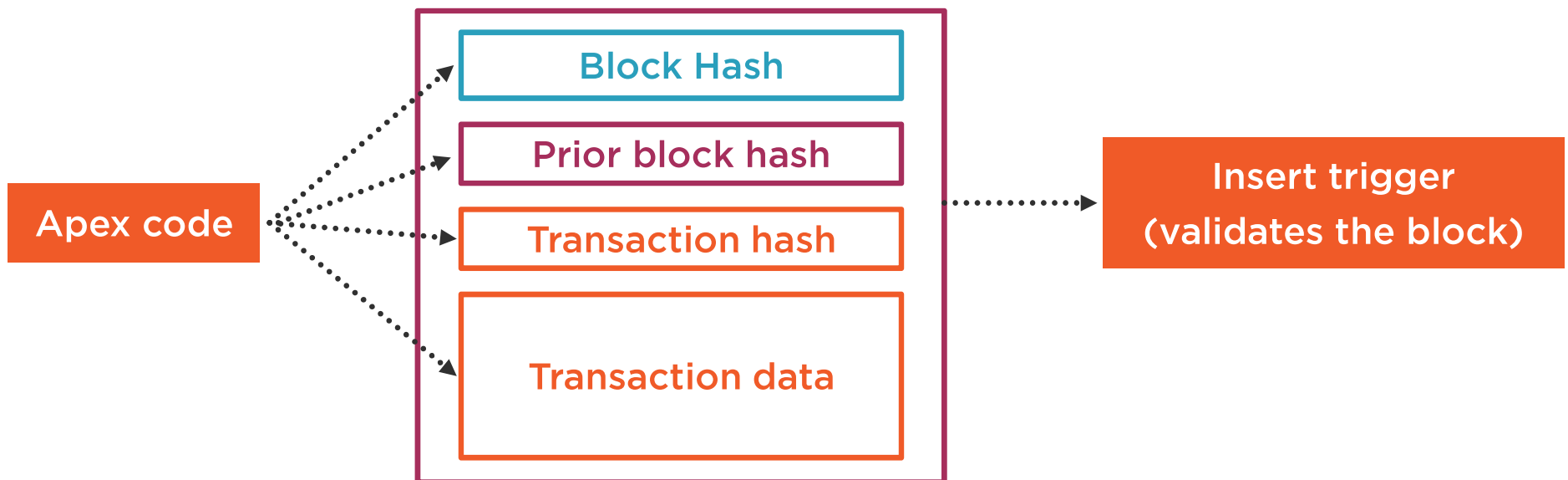
Apex code

- Block Hash
- Prior block hash
- Transaction hash
- Transaction data

Insert trigger (validates the block)
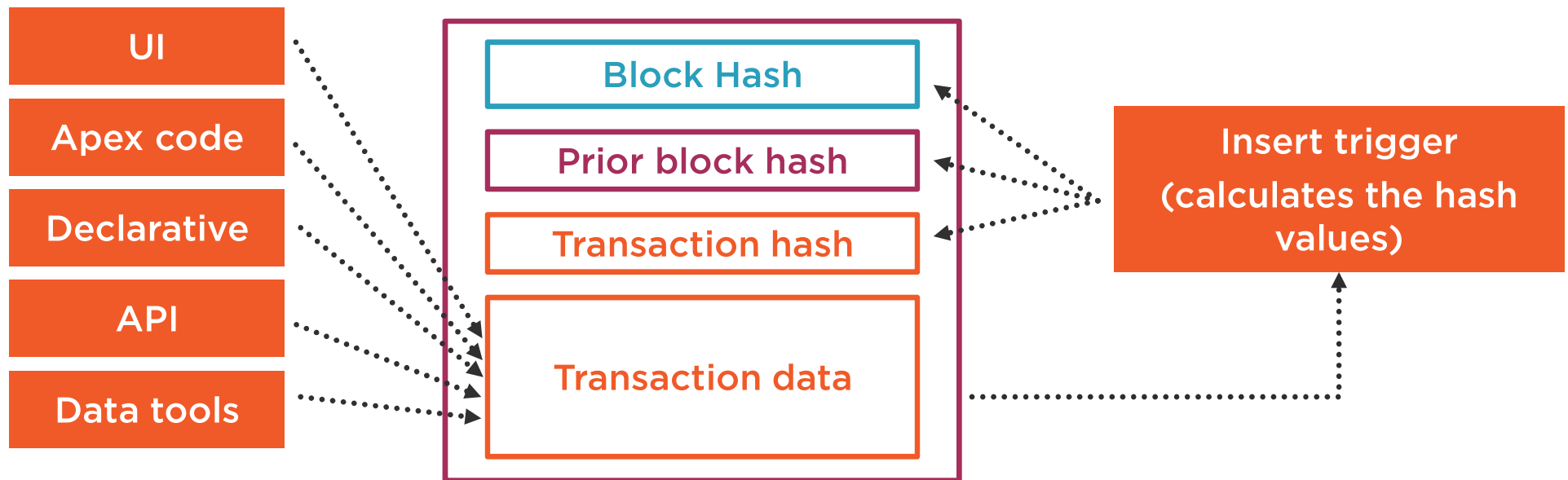
Use security configuration and additional code to block updates and unauthorized insertion

Option #2 – Calculate Blocks on Insert

| UI |
| Apex code |
| Declarative |
| API |
| Data tools |

Block Hash

Prior block hash

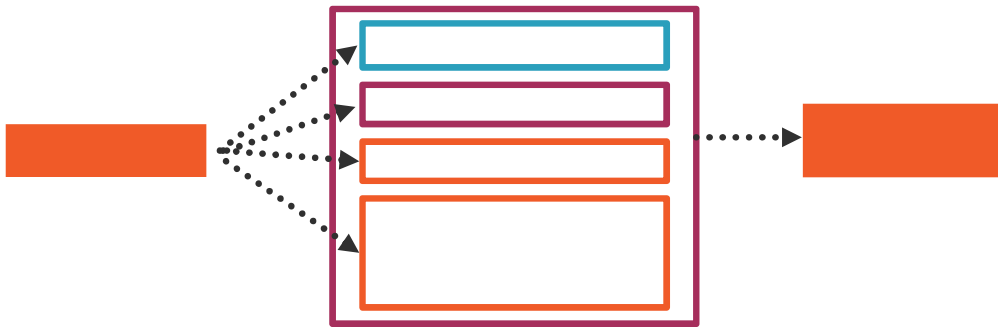**Transaction hash**

Transaction data

Insert trigger (calculates the hash values)

Use security configuration and additional code to block updates and unauthorized insertion

Two Options

Option #1
Use code to calculate all block fields and set them directly.
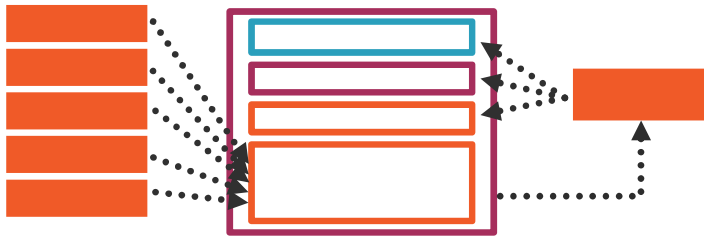Verify fields in database insert trigger

Option #2
Blocks can be inserted with transaction data only.
Calculate blockchain hash fields in database insert trigger

Our Choice

Option #2

However, both options would share certain design elements such as:

Handling concurrency issues

Using update triggers to secure the data
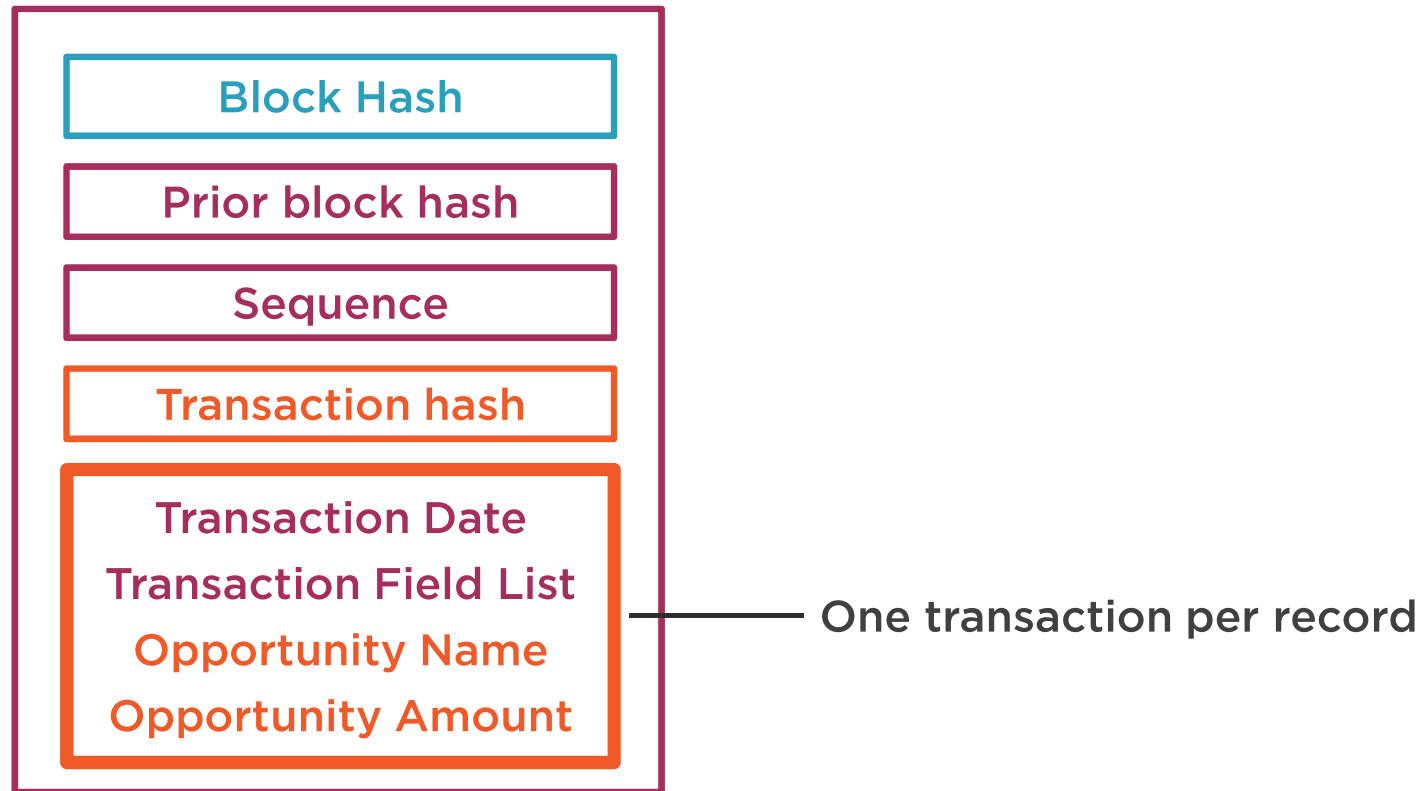
The Data Model

Our Data Model

Block Hash

Prior block hash

Sequence

Transaction hash

Transaction Date
Transaction Field List
Opportunity Name
Opportunity Amount

One transaction per record

The Ledger Entry custom object

Q Search Setup

Setup   Home   Object Manager ⌄

SETUP > OBJECT MANAGER
Ledger Entry

Details	**Edit Custom Object** **Ledger Entry**

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Object Limits

Record Types

Related Lookup Filters

Search Layouts

Triggers

Validation Rules

Edit Custom Object
Ledger Entry

Help for this Page ❓

Custom Object Definition Edit	Save	Save & New	Cancel

Custom Object Information   ▌ = Required Information

The singular and plural labels are used in tabs, page layouts, and reports.
Be careful when changing the name or label as it may affect existing integrations and merge templates.

Label	▌ Ledger Entry	Example: **Account**
Plural Label	▌ Ledger Entries	Example: **Accounts**
Starts with vowel sound	☐	

The Object Name is used when referencing the object via the API.

Object Name	▌ Ledger_Entry	Example: **Account**

Description	Entry in our prototype blockchain ledger

Context-Sensitive Help Setting   ⦿ Open the standard Salesforce.com Help & Training window
                                   ○ Open a window using a Visualforce page

Content Name   --None-- ▾

Secure | https://momentum-page-5021-dev-ed.lightning.force.com/one/one.app#/setup/object/01I5B0000005IY9/edit?nodeId=ObjectManager&address=%2F01I5B0000... ☆

Q Search Setup

Setup   Home   Object Manager ∨

SETUP > OBJECT MANAGER

Ledger Entry

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Object Limits

Record Types

Related Lookup Filters

Search Layouts

Triggers

Validation Rules

Enter Record Name Label and Format

The Record Name appears in page layouts, key lists, related lists, lookups, and search results. For example, the Record Name for Account is "Account Name" and for Case it is "Case Number". Note that the Record Name field is always called "Name" when referenced via the API.

Record Name | Ledger Entry Name | Example: **Account Name**

Data Type | Auto Number ▾

Display Format | {0000000000} | Example: **A-{0000}** <u>What Is This?</u>

Optional Features

☑ Allow Reports
☐ Allow Activities
☑ Track Field History
☐ Allow in Chatter Groups

Object Classification

When these settings are enabled, this object is classified as an Enterprise Application object. When these settings are disabled, this object is classified as a Light Application object. <u>Learn more.</u>
☑ Allow Sharing
☑ Allow Bulk API Access
☑ Allow Streaming API Access

Deployment Status   <u>What is this?</u>

◯ In Development
◉ Deployed
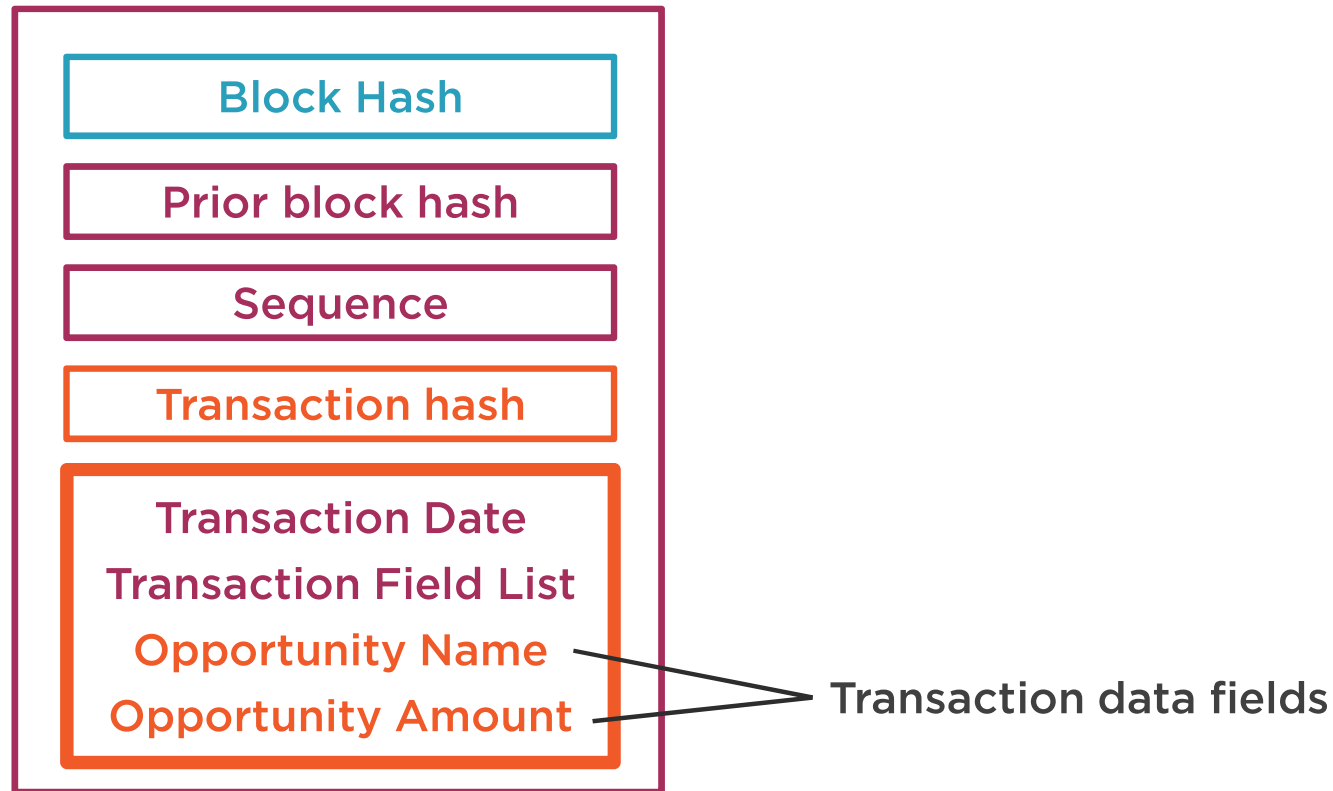
Our Data Model

Block Hash

Prior block hash

Sequence

Transaction hash

Transaction Date
Transaction Field List
Opportunity Name
Opportunity Amount — Transaction data fields

The Ledger Entry custom object

Secure | https://momentum-page-5021-dev-ed.lightning.force.com/one/one.app#/setup/object/01I5B0000005IY9/all/FieldsAndRelationships?a:t=1517199329931

Q Search Setup

Setup   Home   Object Manager ∨

SETUP > OBJECT MANAGER
Ledger Entry

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Object Limits

Record Types

Related Lookup Filters

Search Layouts

Triggers

Validation Rules

Fields & Relationships
12 Items, Sorted by Field Label

Q Find in page   New   Field Dependencies   Set History Tracking

FIELD LABEL ▲	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED	
Block Hash	Block_Hash__c	Text(70) (External ID) (Unique Case Sensitive)		✓	▼
Created By	CreatedById	Lookup(User)			
Last Modified By	LastModifiedById	Lookup(User)			
Ledger Entry Name	Name	Auto Number		✓	▼
Opportunity Amount	Opportunity_Amount__c	Currency(18, 0)			▼
Opportunity Name	Opportunity_Name__c	Text(120)			▼
Owner	OwnerId	Lookup(User,Group)		✓	
Prior Block Hash	Prior_Block_Hash__c	Text(70) (Unique Case Sensitive)		✓	▼
Sequence	Sequence__c	Number(18, 0) (External ID) (Unique)		✓	▼

🔍 Search Setup

☆ ▾ ➕ ? ⚙ 🔔 🐷

::: Setup   Home   Object Manager ▾

Ledger Entry

Details	**Custom Field Definition Edit** Change Field Type	Save	Cancel
Fields & Relationships	**Field Information** ▌ = Required Information
Page Layouts	Field Label [Opportunity Name] Data Type Text
Lightning Record Pages	Field Name [Opportunity_Name]
	Description [Name of the opportunity]
Buttons, Links, and Actions	Help Text [ ] ⓘ
Compact Layouts	
Object Limits	**General Options**
Record Types	Required ☐ Always require a value in this field in order to save a record
Related Lookup Filters	Unique ☐ Do not allow duplicate values
	⦿ Treat "ABC" and "abc" as duplicate values (case insensitive)
Search Layouts	◯ Treat "ABC" and "abc" as different values (case sensitive)
	External ID ☐ Set this field as the unique record identifier from an external system
Triggers	Default Value Show Formula Editor
Validation Rules	

Use formula syntax: Enclose text and picklist value API names in double quotes : ("the_text"), include numbers without quotes : (25), show percentages as decimals: (0.10), and express date calculations in the standard format: (Today() + 7)

Text Options

Length ▌[120]

Q   Search Setup

⣿ Setup   Home   Object Manager ⌄

SETUP > OBJECT MANAGER
Ledger Entry

Details	Ledger Entry Custom Field **Opportunity Amount** Back to Ledger Entry
Fields & Relationships	
Page Layouts	Validation Rules [0]
Lightning Record Pages	**Custom Field Definition Detail** [Edit] [Set Field-Level Security] [View Field Accessibility]
Buttons, Links, and Actions	**Field Information**
Compact Layouts	
Object Limits	
Record Types	
Related Lookup Filters	
Search Layouts	
Triggers	
Validation Rules	

Help for this Page ❓

Field Information

Field Label	Opportunity Amount	Object Name	Ledger Entry
Field Name	Opportunity_Amount	Data Type	Currency
API Name	Opportunity_Amount__c		
Description	Amount of the opportunity		
Help Text			
Created By	User User, 1/28/2018 8:12 PM	Modified By	User User, 1/28/2018 8:19 PM

General Options

Required	☐
Default Value	

Currency Options

Length	16
Decimal Places	2

Validation Rules   [New]   Validation Rules Help ❓

Q Search Setup

Setup   Home   Object Manager ⌄

SETUP > OBJECT MANAGER
Ledger Entry

Validation Rules
2 Items, Sorted by Rule Name

New

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Object Limits

Record Types

Related Lookup Filters

Search Layouts

Triggers

Validation Rules

RULE NAME ▲	ERROR LOCATION	ERROR MESSAGE	ACTIVE	MODIFIED BY	
Opportunity_Amount_must_be_specified	Top of Page	Opportunity amount must be specified in each ledger entry	✓	User User, 1/28/2018, 8:12 PM	⌄
Opportunity_name_must_be_specified	Top of Page	An opportunity name must be specified for each ledger entry	✓	User User, 1/28/2018, 8:12 PM	⌄

Q Search Setup

::: Setup   Home   Object Manager ⌄

SETUP > OBJECT MANAGER
Ledger Entry

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Object Limits

Record Types

Related Lookup Filters

Search Layouts

Triggers

Validation Rules

Ledger Entry Validation Rule
Back to Ledger Entry

Help for this Page ❓

Validation Rule Detail   [Edit] [Clone]

Rule Name	Opportunity_Amount_must_be_specified	Active	✓
Error Condition Formula	ISBLANK(Opportunity_Amount__c)		
Error Message	Opportunity amount must be specified in each ledger entry	Error Location	Top of Page
Description	Enforce opportunity amount		
Created By	User User, 1/28/2018 8:12 PM	Modified By	User User, 1/28/2018 8:12 PM

[Edit] [Clone]

Q Search Setup

::: Setup   Home   Object Manager ∨

SETUP > OBJECT MANAGER
Ledger Entry

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Object Limits

Record Types

Related Lookup Filters

Search Layouts

Triggers

Validation Rules

Ledger Entry Validation Rule
Back to Ledger Entry

Help for this Page ❓

Validation Rule Detail   [Edit] [Clone]

Rule Name	Opportunity_name_must_be_specified	Active	✓
Error Condition Formula	ISBLANK(Opportunity_Name__c)		
Error Message	An opportunity name must be specified for each ledger entry	Error Location	Top of Page
Description	Enforce an opportunity name		
Created By	User User, 1/28/2018 8:12 PM	Modified By	User User, 1/28/2018 8:12 PM

[Edit] [Clone]
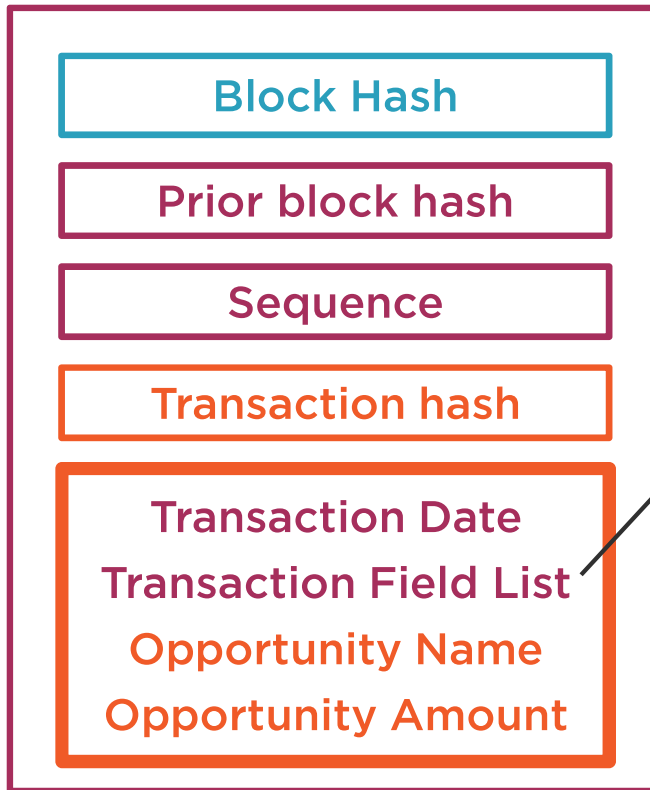
Transaction Field Types

Avoid lookup (ID) fields – A deleted object can invalidate the whole chain, and exports and imports become impossible

Avoid formula fields – A changed value in a formula can invalidate the entire chain
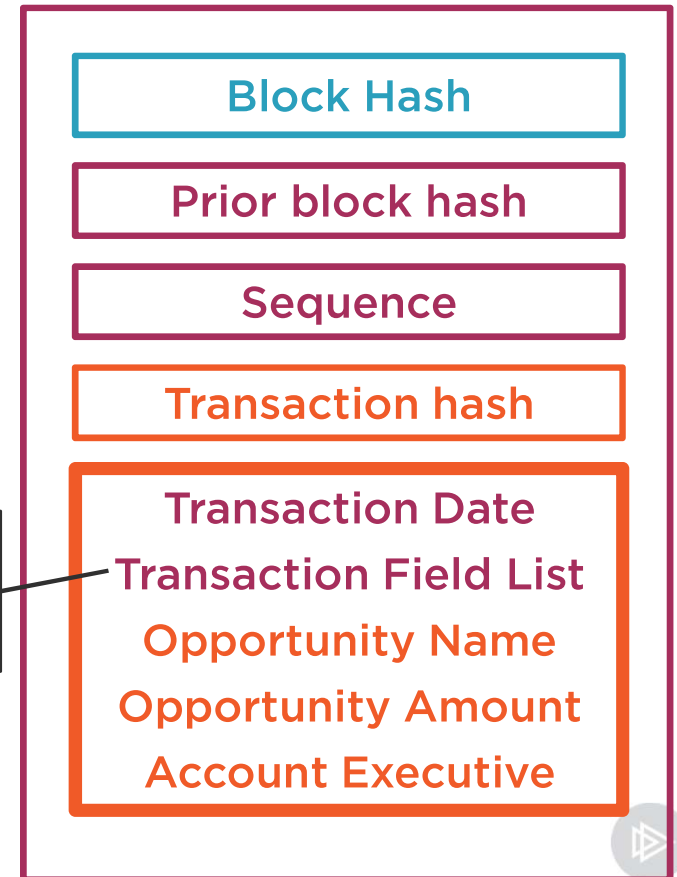
You Can Add Fields Over Time

Ledger Entry V1

Block Hash
Prior block hash
Sequence
Transaction hash

Transaction Date
Transaction Field List
Opportunity Name
Opportunity Amount

Opportunity_Name__c,
Opportunity_Amount__c

Opportunity_Name__c,
Opportunity_Amount__c
Account_Executive__c

Ledger Entry V2

Block Hash
Prior block hash
Sequence
Transaction hash

Transaction Date
Transaction Field List
Opportunity Name
Opportunity Amount
Account Executive

Q Search Setup

Setup   Home   Object Manager ⌄

SETUP > OBJECT MANAGER
Ledger Entry

Details	Ledger Entry Custom Field
	Transaction Field List
Fields & Relationships	Back to Ledger Entry
Page Layouts	Validation Rules [0]
Lightning Record Pages	
Buttons, Links, and Actions	**Custom Field Definition Detail** Edit Set Field-Level Security View Field Accessibility
Compact Layouts	**Field Information**
Object Limits	
Record Types	
Related Lookup Filters	
Search Layouts	
Triggers	
Validation Rules	

Field Information

Field Label	Transaction Field List	Object Name	Ledger Entry
Field Name	Transaction_Field_List	Data Type	Long Text Area
API Name	Transaction_Field_List__c		
Description	List of API names of fields included in the transaction. Fields must not be calculated and must not be relationship fields.		
Help Text			
Created By	User User, 1/28/2018 8:12 PM	Modified By	User User, 1/28/2018 8:12 PM

General Options

Default Value	

Long Text Area Options

# Visible Lines	3	Length	32,768

Validation Rules   New   Validation Rules Help ?

No validation rules defined.

Help for this Page ?

Our Data Model

Block Hash

Prior block hash

Sequence

Transaction hash

Transaction Date
Transaction Field List
Opportunity Name
Opportunity Amount
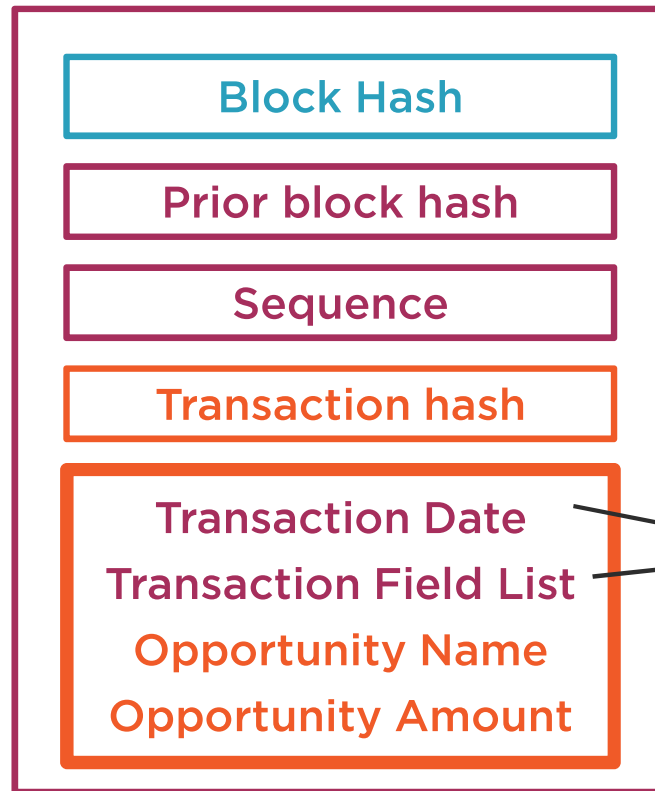
These are blockchain fields that we are hashing with the transaction. This will keep them private, and make the data more secure

The Ledger Entry custom object

Our Data Model

Block Hash

Prior block hash

Sequence

Transaction hash ———— This is a hash of all the fields in the transaction

Transaction Date
Transaction Field List
Opportunity Name
Opportunity Amount

The Ledger Entry custom object

Q Search Setup

Setup   Home   Object Manager ⌄

SETUP > OBJECT MANAGER
Ledger Entry

Details	Ledger Entry Custom Field
Fields & Relationships	**Transaction Hash**
Page Layouts	Back to Ledger Entry
Lightning Record Pages	
Buttons, Links, and Actions	
Compact Layouts	
Object Limits	
Record Types	
Related Lookup Filters	
Search Layouts	
Triggers	
Validation Rules	

Help for this Page

Validation Rules [0]

Custom Field Definition Detail   Edit   Set Field-Level Security   View Field Accessibility

Field Information

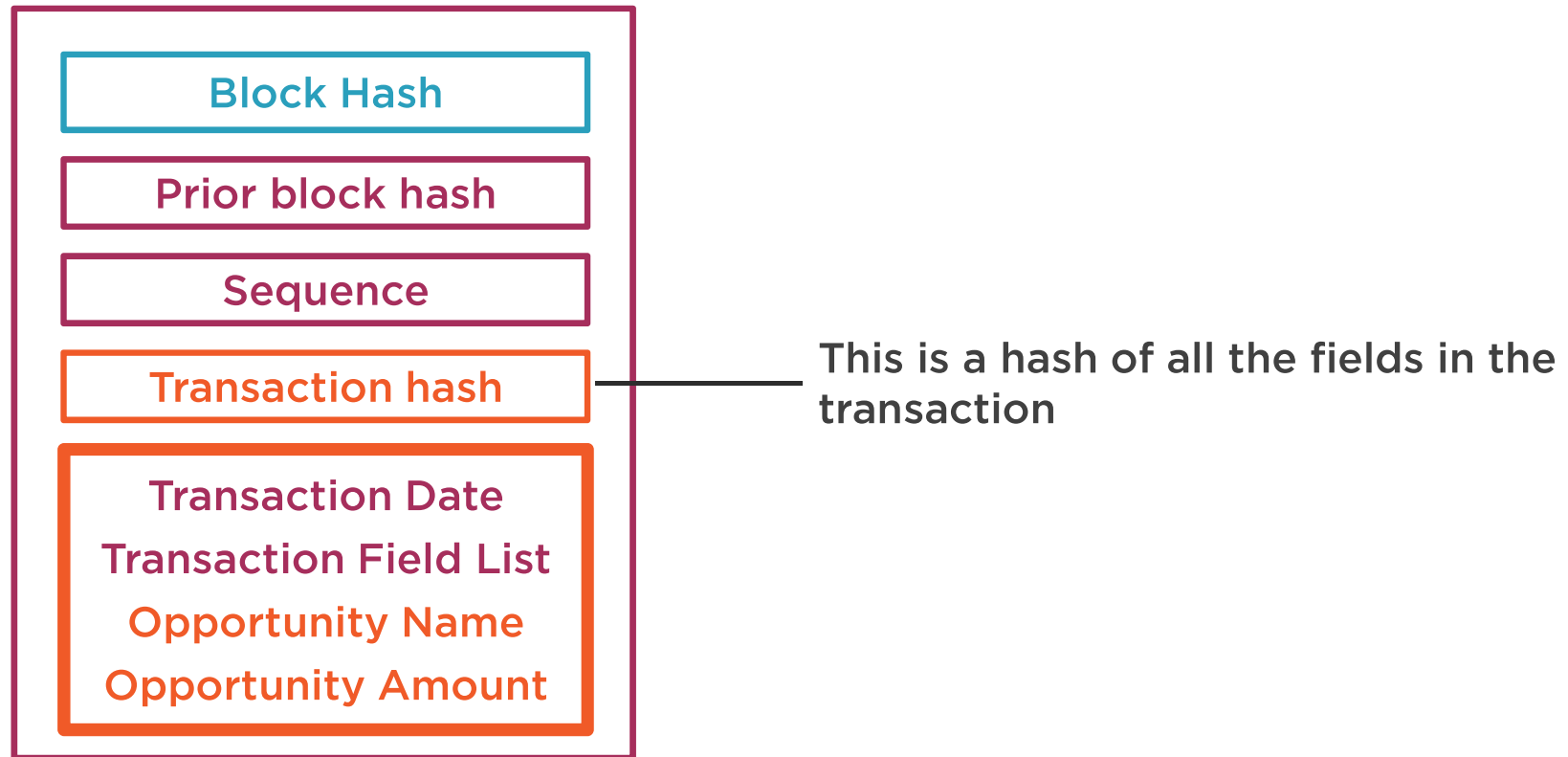|			
Field Label	Transaction Hash	Object Name	Ledger Entry
Field Name	Transaction_Hash	Data Type	Text
API Name	Transaction_Hash__c		
Description	Hash of the transaction fields		
Help Text			
Created By	User User, 1/28/2018 8:12 PM	Modified By	User User, 1/28/2018 8:12 PM

General Options

Required	☐
Unique	☐
Case Sensitive	☐
External ID	☐
Default Value	

Text Options

Length	70

Our Data Model

Block Hash

Prior block hash

Sequence ————— This is the position of the block in the blockchain. The first block is zero

Transaction hash

Transaction Date
Transaction Field List
Opportunity Name
Opportunity Amount

The Ledger Entry custom object

Q Search Setup

Setup | Home | Object Manager ⌄

SETUP > OBJECT MANAGER
Ledger Entry

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Object Limits

Record Types

Related Lookup Filters

Search Layouts

Triggers

Validation Rules

Ledger Entry Custom Field
Sequence
Back to Ledger Entry

Help for this Page

Validation Rules [0]

Custom Field Definition Detail   Edit | Set Field-Level Security | View Field Accessibility

Field Information

Field Label	Sequence	Object Name	Ledger Entry
Field Name	Sequence	Data Type	Number
API Name	Sequence__c		
Description	Sequence of this entry in the block chain		
Help Text			
Created By	User User, 1/28/2018 8:12 PM	Modified By	User User, 1/28/2018 8:12 PM

General Options

Required	☐
Unique	✓
External ID	✓
Default Value	

Number Options

Length	18
Decimal Places	0

Our Data Model

Block Hash

Prior block hash — This is the Block Hash of the previous block in the blockchain

Sequence

Transaction hash

Transaction Date
Transaction Field List
Opportunity Name
Opportunity Amount

The Ledger Entry custom object

Q   Search Setup

Setup   Home   Object Manager   ⌄

SETUP > OBJECT MANAGER
Ledger Entry

Details	
Fields & Relationships	
Page Layouts	
Lightning Record Pages	
Buttons, Links, and Actions	
Compact Layouts	
Object Limits	
Record Types	
Related Lookup Filters	
Search Layouts	
Triggers	
Validation Rules	

Ledger Entry Custom Field
Prior Block Hash
Back to Ledger Entry

Help for this Page ❓

Validation Rules [0]

Custom Field Definition Detail   [Edit] [Set Field-Level Security] [View Field Accessibility]

Field Information

Field Label	Prior Block Hash	Object Name	Ledger Entry
Field Name	Prior_Block_Hash	Data Type	Text
API Name	Prior_Block_Hash__c		
Description	Hash of the prior block (aka, block_hash__c of the prior block)		
Help Text			
Created By	User User, 1/28/2018 8:12 PM	Modified By	User User, 1/28/2018 8:12 PM

General Options

Required	☐
Unique	✓
Case Sensitive	✓
External ID	☐
Default Value	

Text Options

Length	70

Our Data Model

Block Hash ——— This is hash of the prior block hash, sequence and transaction hash

Prior block hash

Sequence

Transaction hash

Transaction Date
Transaction Field List
Opportunity Name
Opportunity Amount

The Ledger Entry custom object

Q   Search Setup

Setup   Home   Object Manager ⌄

SETUP > OBJECT MANAGER
Ledger Entry

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Object Limits

Record Types

Related Lookup Filters

Search Layouts

Triggers

Validation Rules

Ledger Entry Custom Field
Block Hash
Back to Ledger Entry

Help for this Page ❓

Validation Rules [0]

Custom Field Definition Detail   [Edit] [Set Field-Level Security] [View Field Accessibility]

Field Information

Field Label	Block Hash	Object Name	Ledger Entry
Field Name	Block_Hash	Data Type	Text
API Name	Block_Hash__c		
Description	The hash of the transaction hash and the previous block hash		
Help Text			
Created By	User User, 1/28/2018 8:12 PM	Modified By	User User, 1/28/2018 8:12 PM

General Options

Required	☐
Unique	✓
Case Sensitive	✓
External ID	✓
Default Value	

Text Options

Length	70

Creating and Validating Transactions

Choosing "Without Sharing"

Controlled Access

Full Access

Block Hash

Prior block hash

Sequence

Transaction hash

Transaction Date
Transaction Field List
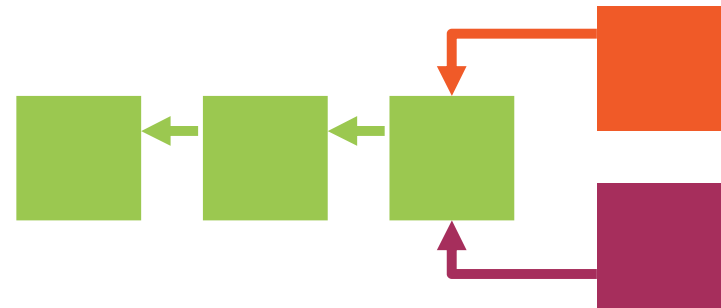Opportunity Name
Opportunity Amount
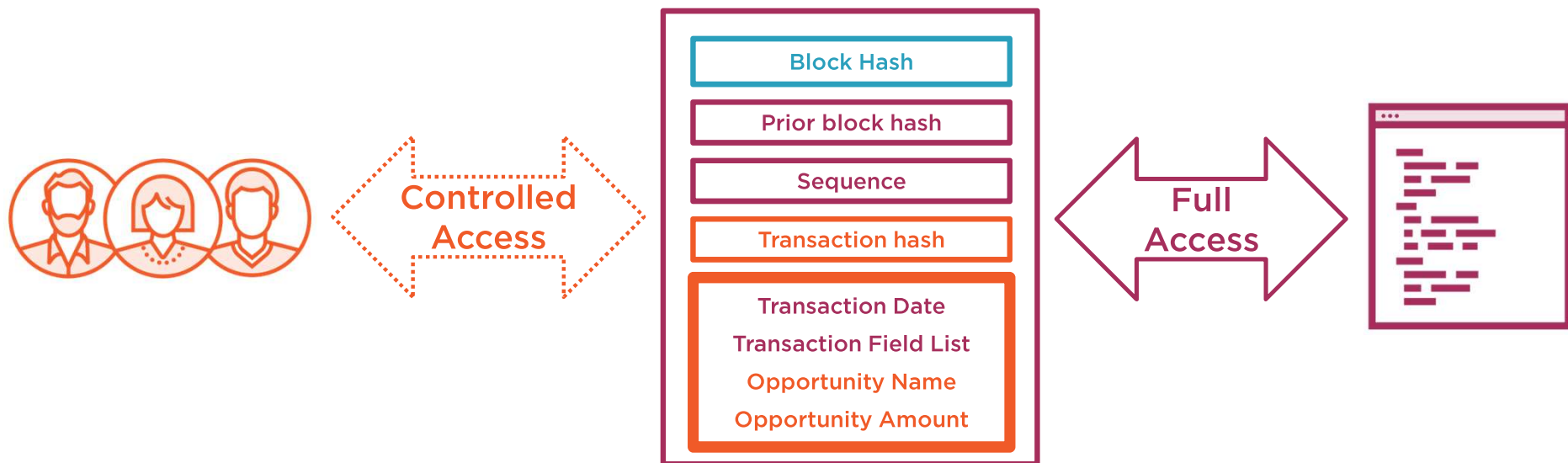
Adding Blocks to the Blockchain

Multithreading Issues
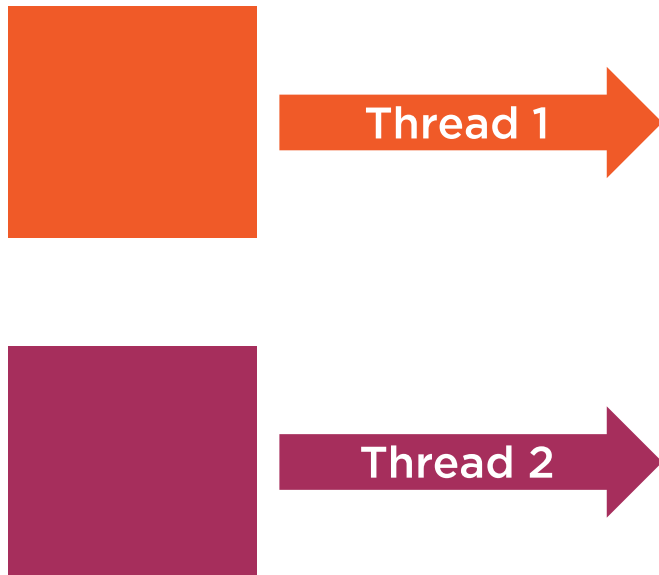
Thread 1

Thread 2

Without a locking system, we might end up with this...

Multithreading Issues

Thread 1
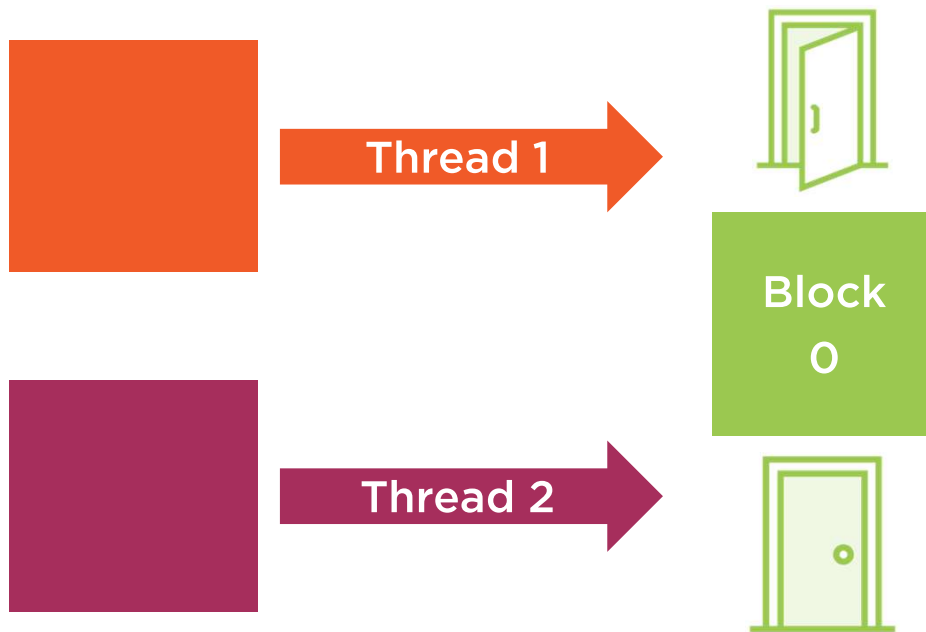
Thread 2

Block 0

The database lock provides access to one thread at a time

Multithreading Issues

Thread 1
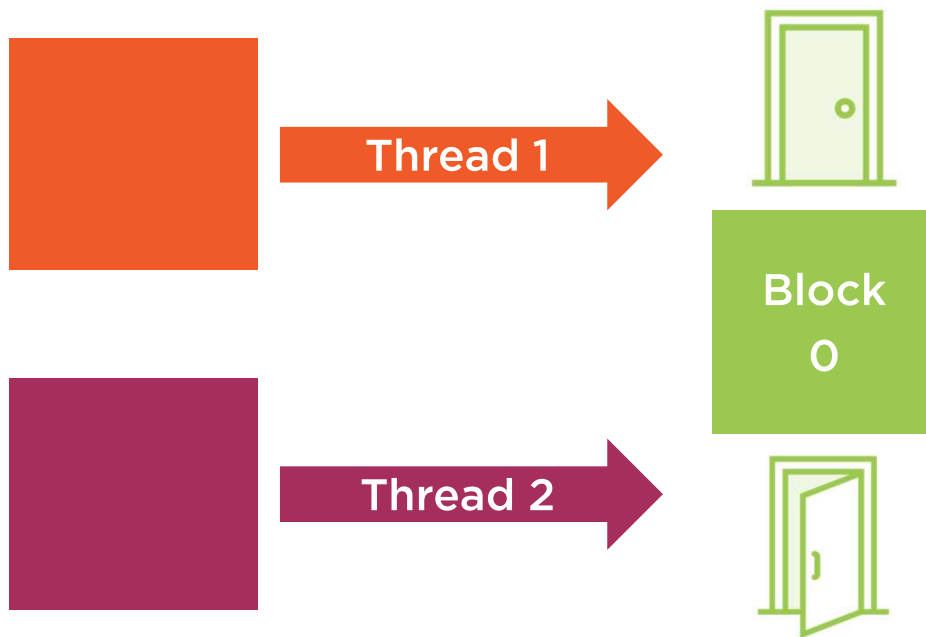
Block 0

Thread 2

The database lock provides access to one thread at a time

Validation Before Inserting Blocks

Option #1

Option #2

Validate the entire blockchain

Not feasible in Apex

Store requests for processing after validation

Possible, but complex

Trust that the blockchain is valid

Trust routine validation

Validating the Blockchain

File   Edit   Selection   View   Go   Debug   Tasks   Help

EXPLORER

OnInsertLedgerEntry.trigger ✕

```apex
1   trigger OnInsertLedgerEntry on Ledger_Entry__c (before insert) {
2
3       LedgerSupport ls = new LedgerSupport(trigger.new);
4       ls.processBlockInsertions();
5
6   }
```

▲ OPEN EDITORS
    OnInsertLedgerEntry.trig...
▲ FORCECHAIN
    ▷ .sfdx
    ▷ .vscode
    ▷ config
    ▲ force-app
        ▲ main
            ▲ default
                ▷ aura
                ▷ classes
                ▷ layouts
                ▷ objects
                ▷ profiles
                ▷ tabs
                ▲ triggers
                    OnInsertLedgerEntr...
                    ﹌ OnInsertLedgerEntr...
    ≡ .forceignore
    ◆ .gitignore
    ⓘ README.md
    {} sfdx-project.json

▷ RUNNING TASKS

✕ 0 ⚠ 0   psBlockchain   Ln 1, Col 65   Spaces: 4   UTF-8   LF   Apex ☺

File   Edit   Selection   View   Go   Debug   Tasks   Help

EXPLORER

● LedgerScheduleValidation.cls ✕

⊿ OPEN EDITORS
  ● LedgerScheduleValidatio...
⊿ FORCECHAIN
  ▷ .vscode
  ▷ config
  ⊿ force-app
    ⊿ main
      ⊿ default
        ▷ aura
        ⊿ classes
          ● LedgerScheduleVal...
          ﹩ LedgerScheduleVal...
          ● LedgerSupport.cls
          ﹩ LedgerSupport.cls-...
          ● LedgerTransaction....
          ﹩ LedgerTransaction....
          ● LedgerValidation.cls
          ﹩ LedgerValidation.cl...
          ● TestLedgerInsertion...
          ﹩ TestLedgerInsertion...
          ● TestLedgerValidatio..
          ﹩ TestLedgerValidatio..
        ▷ layouts
        ▷ objects
        ▷ profiles
   ▷ tabs
        ▷ triggers
▷ RUNNING TASKS

```apex
global without sharing class LedgerScheduleValidation implements Schedulable {
    global void execute(SchedulableContext sc)
    {
        validateLedger();
    }


    global static void validateLedger()
    {
        LedgerValidation validationBatchClass = new LedgerValidation();
        ID batchID = Database.executeBatch(validationBatchClass);
    }
}

```

⊗ 0 ⚠ 0   🗀 psBlockchain   Ln 13, Col 1   Spaces: 4   UTF-8   LF   Apex   ☺

Securing the Blockchain

Demo
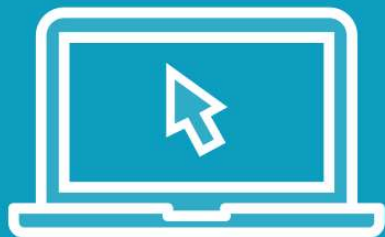
Using and securing the ledger

Don't forget to build a delete trigger as well!
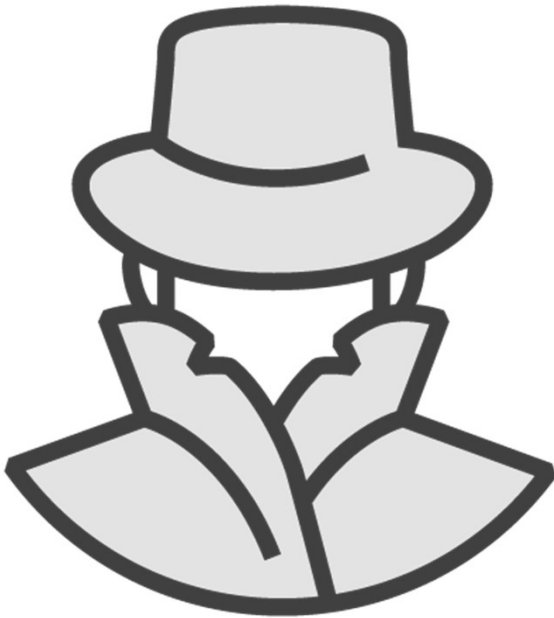
Combine Security Approaches

Object and field level security

(also page layouts)

Sharing rules if appropriate

Apex code (triggers)

Tampering with the Ledger

I have to do what?

Modify security configuration or gain admin access

Identify and disable triggers

Run away, because I won't be able to hide my trail

← → C 🔒 Secure | https://momentum-page-5021-dev-ed.lightning.force.com/one/one.app#/setup/SecurityEvents/home?a:t=1517359930649

Q Search Setup

Setup   Home   Object Manager ⌄

Q audit

⌄ Security

View Setup Audit Trail

Didn't find what you were looking for? Search all of Setup instead.

SETUP
View Setup Audit Trail

View Setup Audit Trail

Help for this Page ❓

The last 20 entries for your organization are listed below. You can download your organization's setup audit trail for the last six months (Excel .csv file).

View Setup Audit Trail

Date	User	Source Namespace Prefix	Action	Section	Delegate User ❓
1/30/2018 4:52:03 PM PST	test-qtq2eu0vt9oe@demo_company.net		Changed Ledger Entry Trigger code: OnUpdateLedgerEntry	Apex Trigger	
1/30/2018 4:37:38 PM PST	test-qtq2eu0vt9oe@demo_company.net		Created Ledger Entry Trigger code: OnUpdateLedgerEntry	Apex Trigger	
1/30/2018 4:35:40 PM PST	test-qtq2eu0vt9oe@demo_company.net		Deleted Ledger Entry Trigger code: OnUpdateLedgerEntry	Apex Trigger	
1/30/2018 4:30:13 PM PST	test-qtq2eu0vt9oe@demo_company.net		Created Ledger Entry Trigger code: OnUpdateLedgerEntry	Apex Trigger	
1/30/2018 4:18:49 PM PST	test-qtq2eu0vt9oe@demo_company.net		Changed profile Cloned Standard User: Ledger Entry object permissions were changed from No Access to Read, Create, View All	Manage Users	
1/30/2018 4:14:22 PM PST	test-qtq2eu0vt9oe@demo_company.net		Created profile Cloned Standard User: Cloned from profile Standard User	Manage Users	
1/30/2018 4:11:43 PM PST	test-qtq2eu0vt9oe@demo_company.net		Changed tabs of custom app Sales	Custom Apps	
1/30/2018 4:10:49 PM PST	test-qtq2eu0vt9oe@demo_company.net		Changed profile Standard User: field-level security for Ledger Entry: Block Hash was changed from No Access to Read/Write	Manage Users	
1/30/2018 4:00:53 PM PST	test-qtq2eu0vt9oe@demo_company.net		Deleted Ledger Entry Trigger code: OnUpdateLedgerEntry	Apex Trigger	
				Custom	

It's Exactly What I Was Looking For!

Effective

Efficient

Simple

What's next?