Design on creating a time series that is a prefix path of an existing time series

一.Background

Up to date, it fails to create a time series that is a prefix path of an existing time series in IoTDB system.

e.g.

(1) create time series by "create" statement：（Here's execution order)

```
create timeseries root.a.b.c.d with datatype=float
```

```
create timeseries root.a.b.c with datatype=float
```

Creating time series root.a.b.c fails.

(2) create time series by "insert" statement：（Here's execution order)

```
insert into root.a.b.c(timestamp, d) values(1, 1.0)
```

```
insert into root.a.b(timestamp, c) values(1, 1.0)
```

Creating time series root.a.b.c fails.

二.Design

1.Currently, there're three types to represent nodes on a MTree in the system：MNode, StorageGroupMNode, MeasurementMNode.

StorageGroupMNode and MeasurementMNode are inherited from MNode and respectively represent the storage node and measurement node. The remaining nodes (including the root node) are directly implemented by MNode.

2.After the modification, the prefix path of an existing time series can be converted into a time series in the following ways:（given time series root.a.b.c.d already exists)

(1) `create timeseries root.a.b.c with datatype=float`

(2) `insert into root.a.b(timestamp, c) values(100, 1.0)`

2.1Procedures of creating time series by "create" statement

(1) Firstly, determine whether "c" is already a MeasurementMNode. If it is, throw the PathAlreadyExistException;（new)

(2) If it isn't, create a MeasurementMNode of c, and replace c(MNode type) in root.a.b.c.d with c(MeasurementMNode type);（new)

(3) As the information to be restored after restarting the system, this plan of creating time series will be serialized into the meta log; (this function already exists in the system, nothing will be modified.)

2.2Procedures of creating time series by "insert" statement

(1) First of all, determine whether "c" is already a MeasurementMNode. If so, return directly.

(2) If not, create c as a MeasurementMNode, and replace c (MNode type) in the root.a.b.c.d time series with c (MeasurementMNode); （new）

(3) Serialize the replacing information into the meta log as the information restored after the system restarts （new）

(4) Based on step (2), we need to add AlterTimeSeriesBasicInfoPlan method that plays a role in restoring information in memory after the system restarts. This method is mainly to serialize the modified information into the disk and deserialize the information from the disk.

3.Test

(1) Test whether it will be successful to create time series that is the prefix path of an existing time series by the two ways.

(2) After creating that type of time series, restart the system to see if the created time series still exist and the system is not abnormal.